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The Subcutaneous Injection of Large Quantities of Normal Saline or other Fluids.

By A. Spicer, F.R.C.V.S., Oxted.

In the human being the subcutaneous injection of large quantities of fluid has to be carried out with considerable care and is a lengthy process. Owing to the fact that there is very little loose connective tissue, the fluid is only allowed to pass in under the force of gravity and must be absorbed as it runs in; if there is any sign of a swelling forming and the flow is reduced and massage applied to distribute the fluid. If this precaution is not taken there is a grave risk that the skin over the swelling will die and slough away.

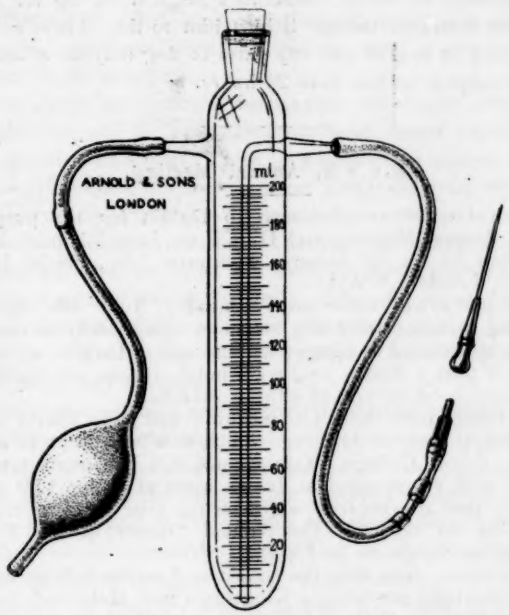
Fortunately, in horses, cattle, sheep, dogs and cats, the skin is loose and if a large swelling is produced no harm is done; the fluid is absorbed in from two to four hours. This saves a great deal of time and it is possible to inject half a gallon of fluid subcutaneously in horses or cattle in from 15 to 20 minutes, and in the dog 250 c.c. can be injected within the space of three or four minutes or less if necessary.

In the one attempt made by the author to inject normal saline into a pig it was a complete failure and it would seem that the pig has no loose connective tissue (in that fact resembling the human being) and therefore one will have to omit the pig from those animals that may be treated with normal saline.

TECHNIQUE.

In the small animal, if one is willing to spare the time, the fluid may be allowed to gravitate into the tissues, and for that purpose a glass tube resembling a large test tube may be used. It has a perforated neck at the bottom to which a length of indiarubber tubing and needle is fitted. The needle is inserted under the skin, and the tube, filled with the fluid, is held over the dog. The rate of flow is largely governed by the size of the needle. For those who have many injections to make this process is much too long, and an enlarged pattern of the late Sir Stewart Stockman's abortion syringe (sent out by Messrs. John Bell & Croyden) is a much better instrument. Here the rate of flow can be governed in two ways; first, by the size of the needle and secondly by the amount of air pressure produced in the glass receptacle by the action of the rubber syringe.

This instrument appears to be quite the best on the market at present, because the pressure applied to drive the fluid under the skin is pneumatic and can be varied at will, and it is perfectly simple to use. If more than one syringeful is required, one has only to remove the rubber cork before the syringe is quite empty and fill it up again. If the syringe should be quite emptied before it is filled again and air gets into the tubing, no harm is done.



There appear to be only two disadvantages with this syringe; one is the expense, as 12s. 6d. is a lot to pay, and the other is that it is made of glass and is easily broken if the patient struggles or it is dropped or knocked against anything; though this is largely a matter of luck, two syringes only having been broken in three years, in which time several thousands of injections have been given. It should be quite possible to make the syringe of metal, and measure the amount of fluid by the bottle from which it is poured.

When the injection is finished and the needle withdrawn it frequently happens that the fluid will leak from the needle hole in quite considerable quantities. The best way to overcome this is to inject a small quantity of air before removing the needle, which has the effect of raising the skin, inflating the subcutaneous tissues and removing the needle from the direct track of the fluid. If this does not suffice, the skin may be massaged between the thumb and first finger until the skin closes. Antiseptic precaution before inserting the needle do not seem to be necessary, as in spite of their absence only one case of abscess formation has been recorded over three years.

The water is always boiled before the sodium chloride is dissolved in it and the solution is stored in Winchester quarts and heated up to about 104° F. before it is injected.

Should the fluid be injected at one spot or at six or eight different places? In practice there would seem to be very little gained by making six or eight punctures. If one were injecting a large quantity the injections would soon coalesce and then nothing is gained, but by starting the injection at the top of the neck in cattle and horses or near the top of the spine in dogs it gives the fluid plenty of room to gravitate downwards. If one were injecting,

say, half a gallon into horses or cattle, absorption would be quicker if half was put into each side of the neck.

After effects—These never seem to last more than about 18 to 20 hours in those dogs in which they occur. As a rule, there are no after-effects, but when they do occur, the dog is very miserable and very stiff, lies in his basket and declines to move; sometimes he will sit up for two or three hours as though it hurt him to lie. These symptoms vary in degree and any class of dog may be affected; they disappear in less than 24 hours.

R.C.V.S. Annual Meeting.

Particulars of an excursion to Dublin for the purpose of the Annual Meeting and Dinner on June 5th have been furnished to us by Messrs. Pickfords Ltd., 53-54 Haymarket, London, S.W.1.

The party will leave on Wednesday, June 4th, by the morning train to Holyhead, luncheon being taken *en route*; thence by steamer to Kingstown and rail to Dublin, arriving about 6 p.m.; dinner at Jury's hotel, rooms overnight at the same hotel or one of similar standing.

Thursday, June 5th. The morning will be at liberty until the Annual General Meeting, which will be held at 12 noon at the Royal College of Surgeons, St. Stephen's Green. Lunch will be provided at Jury's hotel at about 1.30 p.m. and in the afternoon a sight-seeing tour will be made, returning in time for the Annual Dinner at the Royal College of Surgeons at 7 p.m.

On Friday, June 6th, the return to London will be made by the daylight service *via* Kingstown and Holyhead, lunch being taken *en route*. Inclusive cost per person will be £5 14s., subject to a minimum of eight persons in the party. The price includes third-class rail fares with first-class on steamers, luncheons and accommodation as indicated, and the afternoon excursion, but not the cost of the Annual Dinner. Applications for tickets should be directed to Pickfords Ltd., 53-54 Haymarket, London, S.W.1, not later than the 31st instant.

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List of Hotels.

	Bed and Breakfast.	Per day, etc.
Hotel Elliot, 64 Harcourt Street ...	7/- ...	10/6 inclusive. £2/10/- per week.
Hotel Gerard, 37 Harcourt Street ...	6/6 ... with bath.	10/- per day. Lunch 2/6, Tea 2/6.
Hotel la Rue, 31 Harcourt Street ...	6/6 ...	12/-.
Hotel McDermott, 33 Harcourt Street ...	7/6 ...	12/- per day. £3/3/- per week.
Hotel Pelletier, Harcourt Street ...	7/6 ...	12/- per day. 3½ guineas per week.
Russel Hotel, Stephens Green ...	9/6 ...	15/- per day. 4½ guineas per week.
Royal Marine Hotel,* Dunlaoghaire ...	About the same as No. 12.	
Gresham Hotel,* O'Connell Street ...	12/6 ...	——
Standard Hotel, 79-82 Harcourt St. ...	10/6 to 12/- ...	15/- per day.
Eastwood Hotel, 91 Lr. Leeson St. ...	8/- ...	12/6 per day.
Shelbourne Hotel,* Stephens Green ...	15/- ...	25/- per day. Lunch 4/6, dinner 6/6.
Hibernian Hotel,* Dawson Street ...	12/6 ...	£1/1/- per day. £6/6/- per week.

N.B.—Nos. 1 and 10 can be recommended as hotels at moderate price.

Book Early.

* First-class Hotels.

Notes on Parasites in 1929.

By A. W. Noël Pillers, F.R.C.V.S.

The table which follows contains the names of some of the parasites and other forms which were examined during the year. To it have been added a few remarks upon species of particular interest.

Name.	Host.	Locality.
Fungi.		
Microsporum equinum.	Horse (skin) ...	Montgomeryshire.
Protozoa.		
Eimeria faurei	Sheep (fæces)	Lancs.
zurni	Ox (fæces) ...	Westmoreland.
Isospora felis	Cat (fæces) ...	Cheshire.
*Hartmannella glebæ** ..	Ox (fæces) ...	Westmoreland.
Myxobolus sp.	Catfish (muscles)	——
Trematoda.		
Schistosoma bovis ...	Sheep (veins) ...	South Africa.
Fasciola gigantea ...	Ox (liver) ...	Uganda.
Cestoda.		
Diplylidium caninum ...	Dog (fæces and skin)	Lancs. and Cheshire.
Hymenolepis diminuta...	Rat (intestine)	Lancs.
Anoplocephala perfoliata	Horse (fæces)	——
Moniezia expansa ...	Ox (intestine)	Lancs.
Amœbotænia sphenoides	Fowl (intestine)	N. Ireland.
Davainea proglottina ...	Fowl (intestine)	,,
echinobothrida	Fowl (intestine)	,,
Cysticercus tenuicollis	Pig (peritoneum)	Cheshire and Yorkshire.
fasciolaris	Mouse (liver) ...	Lancs. and Sudan.
Cœnurus cerebralis ...	Ox (brain) ...	Irish Free State.
serialis	Rabbit (muscles)	Lancs.
Nematoda.		
Toxascaris leonina ...	Cat (intestine)	Cheshire.
Toxacara mystax ...	Cat (intestine)	Central India.
Heterakis gallinæ ...	Fowl, Pheasant (intestine)	Northern Ireland & Oxon.
Capillaria columbæ ...	Turkey (intestine)	Northern Ireland.
Metastrongylus elongatus	Pig (bronchi) ...	Lancs.
salmi	Pig (bronchi) ...	,,
Chærostrongylus brevivaginatus	Pig (bronchi) ...	,,
Porrocæcum sp.	Flounder (muscle)	Scotland.

* Kindly determined by Dr. A. R. D. Adams.

Name.	Host.	Locality.
Acarina.		
Liponyssus arcuatus† ...	Mouse (skin) ...	London.
Notœdres muris ..	Rat (ears) ...	Lancs.
Sarcoptes ovis	Sheep (skin) ...	Sudan and Leicester.
Psoroptes ovis	Sheep (skin) ...	Sudan and Leicester.
Myobia musculi	Mouse (skin) ...	Lancs.
Cytoleichus nudus ...	Pheasant (air sacs)	Oxon.
Glyciphagus domesticus	Sheep and dog (skin)	Leicester and Lancs.
Tyroglyphus longior ..	Dog (fæces) ...	,,
Aleurobius farinæ ..	Dog (fæces) ...	,,
Linguatulida.		
Linguatula serrata ...	Dog (nasal cavity)	,,
Insecta.		
Pulex irritans	——	Northants & Hampshire.
Ctenocephalus canis ...	——	,,
Trichodeches ovis ...	Sheep (skin) ...	Leicester.
Polyplax serrata ...	Mouse (skin) ...	Lancs.
Linognathus pilferus	Dog (skin) ...	,,
Hypoderma bovis ...	Horse (skin) ...	Cheshire.
Eristalis tenax	Cow	Leicester and Glos.
Lucilia sericata	Horse (foot) ...	Lancs.
Atropos divinitoria ..	Furniture ...	,,
Silvanus surinamensis	Oats	,,

† Kindly determined by Dr. A. C. Oudemans.

Fungi.—The *oospora* form of *Microsporum equinum* reported from the horse's skin is known to cause a stubborn dermatomycosis which tends to recur. It is believed that the fungus has a non-parasitic phase in crops used as bedding, and this often explains recurrence.

Protozoa.—A sample of ox fæces contained large numbers of the soil-loving amœba *Hartmannella glebæ*. It can frequently be found in old samples and appears to be devoid of pathogenic effects. Large numbers of myxosporidian protozoa are found in the muscles of fish, often causing cavities containing semi-liquid material. A portion of a cat-fish was found to be thus affected with apparently one of the numerous species of *Myxobolus*.

Trematoda.—*Schistosoma bovis* was collected from the mesenteric veins of a sheep. It formed the subject of a note " Schistosomiasis in South African Sheep," by F. G. Cawston (*Veterinary Record*, Vol. ix, 1929, p. 103). *Fasciola gigantea* was reported from the liver of native cattle in Uganda, where it occupies a position somewhat similar to the common liver fluke of this country.

Cestoda.—The segments of the dog tapeworm *Dipylidium caninum* appear to be often mistaken for something else. The last segments are somewhat circular in cross section and of a pinkish hue. They adhere to the hair of the hindquarters and may be thought to be voided trematodes or even lice.

Anoplocephala perfoliata segments are sometimes found adhering to equine fæces as whitish patches a few millimetres in diameter. Their nature can usually be made out by clearing in a little pure carbolic acid, when eggs bearing a typical pyriform apparatus can be seen under the low power of the microscope.

The three tapeworms *Amœbotœnia sphenoides Davainea proglottina* and *D. echinobothrida* were found together in the intestine of a fowl, where they apparently caused death. Among the cystic forms, *Cœnurus cerebralis* from the ox's brain was reported from an area where rabbits harboured *C. serialis* in their muscles. This fact reminds one of the controversy that the cysts and even the adult worms cannot be distinguished morphologically, although apparently the tapeworms bred from each cyst will only give rise to other cysts in the same species of cyst-host from which they were originally obtained.

Nematoda.—The cæcal worm *Heterakis gallinæ* was found in pheasants and fowls where it was apparently causing losses. *Capillaria columbæ* is usually regarded as a parasite of the pigeon, but it appeared to be pathogenic for turkeys in the present record. Edible fish often contain larval nematodes coiled up in the musculature. Often the adult stage is reached in marine carnivora or cetaceans. A flounder was examined and found to contain an early larva of *Porrocœcum*.

An interesting feature was the finding of all three of the bronchial strongyles, *viz.*, *Metastrongylus apri, M. salmi* and *Chœrostrongylus brevivaginatus*, in a fatal case of verminous bronchitis in a pig.

The dry summer seemed to have lessened the number of nematodes examined.

Acarina.—*Sarcoptes ovis, Psoroptes ovis* and *Glyciphagus domesticus* were all found in a single scraping from a sheep which was showing irritation shortly after having been twice treated with an approved dip. *G. domesticus* has been recorded from sheep on several occasions. It is a common household and store pest. It also occurred on a dog's skin. Two mites, *viz.*, *Tyroglyphus longior* and *Aleurobius farinæ*, with somewhat similar habitats, occurred in large numbers in samples of dogs' fæces, which had been subjected to examination for worm eggs. It is hardly realised with sufficient force that our patients are surrounded by large numbers of mites and that their foods often contain them. The air sac milk (*Cytoleichus nudus*) was reported from a pheasant; it has been considered by many that this mite is more or less harmless, but recent work seems to suggest that it can cause serious mortality, especially during dry warm weather, by irritating the lining of the sacs or even giving rise to pneumonia and pleurisy.

Linguatulida.—The tongue " worm " *Linguatula serrata* was sneezed out from a dog's nose and in another the eggs were discovered in the nasal discharge. It has been pointed out in previous years that one hears of this parasite more often than formerly. An account of its importance to man and of attempted therapeutic measures was given on page 307 of the *Veterinary Journal* (Vol. 35, N.S.) for 1929.

Insecta.—The hot summer was particularly favourable for the multiplication of fleas and both *Pulex irritans* and *Ctenocephalus canis* entered human habitations from near-by kennels. The ox warble (*Hypoderma bovis*) was forwarded from under the skin of a horse and the sheep blow fly (*Lucilia sericata*) was hatched out from "maggots" from a wound in a horse's frog. The rat-tailed maggot (*Eristalis tenax*) was stated to have been found in the fæces of a cow in one case, and to have been seen escaping from a cow's vagina in another. This was the subject of a notice—"The rat-tailed maggot of the Drone Fly (*Eristalis tenax*)" on page 941 of the *Veterinary Record*, Vol. IX, 1929. The small beetle *Silvanus surinamensis* was found in large numbers in sacks of oats, and it was stated to have produced irritation of the arms of the men handling the grain.

General.—Numerous samples of fæces contained eggs of strongyles, tapeworms and flukes. Several were negative. A portion of imported mutton had numerous glumes of some species of grass, embedded in the superficial layers where they somewhat resembled parasites. They probably got into position as the carcass was being dressed. An opportunity was afforded to examine four wire-haired fox terrier puppies which were suffering from "hysteria." No acari could be found in their ears, nostrils, or fæces; the latter contained no worm eggs or coccidia on floatation, and no ectozoa could be discovered by combing. Recovery took place after confinement in a dark place, sedatives and a change of diet.

Tuberculosis Order in Sussex.

At the last meeting of the Sussex County Agricultural Committee, held at Lewes, the Secretary reported that the amount of compensation paid for animals slaughtered under the Tuberculosis Order of 1925 was as follows:—December, 1929, £79 (15); January, 1930, £124 (30); February, 1920, £42 (11); March, 1930, £88 5s. (23).

Mr. J. C. Robinson expressed the opinion that they were not doing all they could under the Order. He was afraid a great many of the owners found it much more to their advantage to sell the affected animals to the dealers than to report them. He thought it was up to them to try and do something more to rid the county of this troublesome disease. They took a great deal of trouble to improve the stalls and so on, and they had to spend a good deal of money to cart the manure away, but it did not appear to get rid of the disease. Clean milk could be, and was, produced in very dirty surroundings, but they could not produce healthy milk from cows suffering from tuberculosis, and he thought they ought to do something more than they were doing at present. By only paying such a small sum in compensation they were not getting anything like all the animals reported that they ought to get.

The Chairman: Do you suggest anything?

Mr. Robinson: I think those who report ought to be treated a little more liberally.

The Secretary: I think that everybody who has an animal killed agrees to the value before the animal is actually slaughtered under the Order. We cannot slaughter unless the owner has agreed to the value.

Mr. Robinson: What does happen is that owners find they do not get very libera1 treatment and they do not report them.

The Chairman: Go somewhere else and sell them?

Mr. Robinson: They are being sold to dealers because they find they can get on very much better than with this committee.

The Secretary: A prosecution is taken whenever a case is found of not reporting, and I do not know that you can do any more.—*Sussex Express.*

Translation—Abstract.

On the Nature and Therapy of Grass Staggers.

By B. Sjollema, Laboratory for Medical Veterinary Chemistry, University of Utrecht, Holland.

(Prepared by the Author, for the "Veterinary Record," from a Paper Published in the "Tydschrift voor Diergeneeskunde.")

(*Continued from page* 430.)

5.—On the Pathogenesis of Grass Staggers.

Now we have to put the question whether it is possible that an intoxication *via* the intestinal canal can lead to symptoms such as those manifested in grass staggers.

Let us for the present take for granted an intoxication arising from an excessive absorption of protein, or of proteins *plus* proteoses, peptones, amides, etc.

Several investigations have clearly revealed to us that when an excessive absorption of proteins takes place, then there is always a grave risk that protein, which has not been sufficiently broken up, will pass through the intestinal canal. One may rightly assume that this will occur all the sooner when external and other circumstances (*i.e.*, œstrus) cause an increased permeability, or—what may be the same—a decreased activity or lowered vitality of the intestinal epithelium[14]. Whether it is necessary to pay attention also to the products of putrefaction in the intestines, remains an open question.

As regards the influence of outward circumstances on the intestinal permeability, we must refer to experiments made with dogs fed on meat containing enteritidis toxins. The control animals which were kept in a moderately-heated locality survived, while the experimental animals which were in a very hot apartment died from the effects of the intoxication[15].

We have to give special attention to those experiments and observations which prove that there is some connection between the condition of the gastro-intestinal tract and the functional efficiency of the parathyroid glands[16].

Seeing that tetany—one of the principal symptoms in grass staggers—is often associated with the damaged function of the parathyroid gland, it is important that the connection between gastro-intestinal and parathyroid gland-disturbances should be demonstrated.

It is likewise necessary to draw attention here to experiments in which other symptoms manifested in grass staggers were experimentally produced.

It was proved that when rabbits were subcutaneously or intracardially injected with pepsine, a diminution in the Ca. and P.-content of the blood serum was manifested[17].

Perhaps just the reverse has to be assumed, *viz.*, that alterations in the mineral blood composition increase the danger of pepsine-intoxication, *viz.*, by means of the changed permeability of the walls of the intestines.

We may expect that if an excessive assimilation of proteins makes the passage of peptonic substances into the blood possible, this condition will give rise to the change in the composition of the blood that is found in grass staggers, especially concerning the calcium level.

It was observed in dogs with an Ecks fistula—which causes the blood of the portal vein to pass directly to the vena cava, instead of to the liver, so that the protective function of the liver is eliminated—that, when fed with meat, or meat *plus* Liebig's meat extract, tetanic cramps, ataxy, anæsthesia, loss of sight and hearing, were manifested; the same appearances, therefore, as those found in grass staggers[18].

These derangements were not present when no meat was administered. These facts are in support of the view that the symptoms of grass staggers can result from intoxications[19].

In 1928 investigations were published by Spadolini[20], according to which a clear connection must exist between hypocalcæmia and the condition of the mucosa of the gastro-intestinal tract.

According to him, the animals proved to be far more susceptible to poisons given orally (histamine, guanidine and adrenaline) after receiving a subcutaneous injection of sodium oxalate, or of sodium phosphate, both of which cause the calcium-content of the blood to decrease. Doses of the organic poisons that were not injurious to normal animals, caused, in the previously-treated animals, the symptoms which are the characteristic when these substances are injected subcutaneously or intravenously. He further states that when, by means of the salt-injections mentioned above, the calcium-content of the blood had decreased to four or five mg. per cent., distinct lesions of the intestinal muscosa were present; frequently even a total destruction of the villi intestinales through necrosis, such as is found in the first stages or parathyroid insufficiency, was seen.

Spadolini found that in dogs, after the parathyroid glands had been wholly or partly removed, the introduction into the blood-stream of bacterial suspensions, or of bacteria-filtrates, brought about a rapid and consistent reduction in the amount of the calcium in the blood. This decrease was greater than in normal dogs. These results harmonise with the experiments of others in so far that they have frequently found that parathyroid-ectomised dogs are sensitive to tainted meat. In these cases toxic products will have augmented the insufficiency.

The observations of Elkourie and Larson[21] also point in the direction of an association between tetany and intestinal epithelium derangements, *viz.*, in parathyroid-prive tetany the epithelium of the duodenum, and of the pylorus part of the stomach is degenerated, congestion of the intestines being also manifested. They found in their operated animals twitching of the muscles, salivation and hyperpnœa.

Some years ago Luckhardt and Compère came to the conclusion, as the result of their experiments, that in parathyroid-tetany an increased permeability of the intestines is present, the consequence being the assimilation of toxic substances. Moreover, they found a depletion of the Ca. and the administration of Ca. acted favourably by restoring the permeability[22].

Brougher[23] tells how he could keep his parathyroidectomised dogs alive by giving them cod-liver oil (calcium-acetate also acted favourably). However, their condition deteriorated during heat, pregnancy or infection, and to a certain extent also during lactation. At the same time there was a reduction of the blood-calcium.

In my opinion, it is interesting to mention that Brougher found that some dogs suffered from grave intestinal disturbances following on an operation in which the parathyroid glands had been removed. One feels disposed to find a confirmation herein of the opinion that the parathyroid glands regulate the permeability (of the histological or functional condition) of the intestines.

According to recent investigations by Reed, *c.s.*[24] it became evident that another circumstance, namely, the fluctuations of the temperature, had an influence on the dogs which had been deprived of their thyroid or parathyroid glands; (they operated on 35 dogs). The loss of power to regulate the temperature was most remarkable (in severe cases of tetany the rectal temperature sometimes rose to 44° C.). When the temperature of the surroundings was high, and especially when the atmosphere was humid, the attacks of tetany were very violent, although not more frequent. It was found also that these animals had less resistance against infection.

As to the external factors, irritating the animals influenced them strongly when they were in an approaching stage of tetany. Sometimes merely rubbing their skins was quite sufficient to bring on an attack of tetany.

Reed, *c.s.*, also draws attention to the appearance of attacks of tetany when the Ca.-content of the blood is higher than is usually accepted as being the critical value.

In the experiments of Reed, *c.s.*, the animals sometimes exhibited diarrhœa; lactose had a favourable action in such cases.

As an instance of the association existing between the condition of the intestines and the parathyroid glands, a case was cited of a man, in the D.Z.f. Nervenheilkunde, 60 years of age, in whom existed an insufficiency of the parathyroid glands. A gastro-intestinal disturbance originated a deterioration of long duration.

Lebedinsky found that, in dogs with stomach-fistulæ according to Pawlow, the removal of the parathyroid glands upset the gastric juice-secretions, and that when calcium chloride was applied orally an improvement took place.

From the evidence reviewed in the present paper, it has been proved that a correlation exists between the insufficiency of the parathyroid glands, changes of the intestinal canal, alterations in the permeability, intoxication, changes in the blood composition, tetany and other symptoms manifesting in grass staggers; perhaps one is right in asserting that one derangement produces others.

Sometimes the one derangement and sometimes the other is primary, cause and effect may alternate; for instance, an insufficiency of the parathyroid glands can give rise to an injury of the intestinal mucous membrane, as well as exactly the reverse, or else a diminution of the blood-calcium can be the cause of disturbances in the functioning of the intestinal mucous membrane.

We have also seen how external factors can be of influence, such as, among other things, fluctuations in the temperature[25].

Furthermore, we must again point out that there is an increased susceptibility to poisons and infections which are closely associated with this complex of abnormalities[26]. In grass staggers and analogous syndromes we see a condition in which one or more of the functions, which

together determine the constitution of the animal, are disturbed; so that the organism can show a deficiency in many directions.

Will the complex of symptoms—the syndrome—be the same when cause and effect (in other words primary and secondary derangements) are at variance, or must one take differences for granted? Will the allied, but different, syndromes and perhaps also the attacks, denoted by us as doubtful cases, differ etiologically?

At present no answer can be given to these problems.

In connection with the pathogenesis of grass staggers it is well to keep the following in mind.

We know yet little about the significance of the endocrine organs for the regulation of the blood composition. It is probable that further study on the occurrence of low blood Ca., which up to now has as a rule been ascribed to an insufficiency of the parathyroid glands, will prove to be connected in some cases with other endocrine organs. Nitschke[27] made a preparation, from calf's thymus which brought about adynamy in rabbits, excessive general spasms, a strongly-increased electrical excitability, and a diminution of the blood-serum-calcium to about 7 mg. per cent.

Another preparation, made from calf's-thymus, reduced the amount of the inorganic phosphoric acid of the blood-serum to about one half, without causing clinical symptoms to arise. He also believes that he has been able to separate a Ca.- and P.-decreasing substance from some other organs (among others the lymph glands).

Let me further recall to mind the tests of Mirvish and Bosman and of Reiss and Marx, who observed a decrease of the blood-calcium from 30 or 40 per cent. (when ovarian extracts were injected[28]. One may deduce from these tests that it is not only the parathyroid glands that effect the blood calcium; but this, of course, does not alter anything as regards the many results obtained after removal of these glands, frequently together with those of the thyroid glands, which most decidedly exercises an influence on the level of the blood calcium.

It is hardly necessary to add here that all that has been written concerning the mechanism of the disturbances of equilibrium, which had to be considered here, and likewise as regards their connection with the symptoms of grass staggers, cannot be more than an hypothesis.

The same applies likewise to the etiology of grass staggers. When, in the end, I assume for the time being that in many cases an intoxication proceeding from the intestinal canal, presumably through an excessive absorption of proteins, is the turning point, then this is also a working hypothesis.

I do not care to speculate whether such intoxications always take place after a labile condition has developed, accompanied by an increased sensibility to poisons and permeability for them, or whether grass staggers can also be caused by intoxication, without this last condition being present.

We have still to remind the reader of the experiments of the last few years[29], that demonstrated a distinct relation between tetany and rickets[30].

With animals made rachitic by the administration of rations with an inadequate ratio of phosphoric acid and calcium (for instance, a high Ca.-content; on the other hand, a low P.-content) it was possible to demonstrate this condition.

If much phosphoric acid is given to such animals, attacks of tetany rapidly occur, even within 8 hours. That the twitching of the muscles and the convulsions observed in such cases may indeed be ascribed to tetany was ascertained by determining the electrical sensitiveness (expressed in milli-ampères) (Shohl, *c.s.*).

Fasting has the same effect on these animals; these manifesting tetany at a later date, however. In both cases an increased amount of inorganic phosphoric acid was found in the blood-serum (*viz.*, fully 9 mg. per cent. calculated as P., instead of *circa* 3·5 in the control animals, which were kept on a rachitic diet), while the Ca.-content was decreased (it was about 7·5 instead of 11·3 mg. per cent.).

That tetany is brought about in rachitic rats both through fasting as well as through administering phosphates, can be accounted for by assuming that during the fast much phosphate is taken from the muscles and other tissues.

From the above it is obvious that the content of phosphoric acid in the fodder and the Ca. : P. ratio should be considered from an etiological point of view.

Meanwhile, one ought to remember that what has just been said as regards the influence of fasting or of phosphates, does not apply to normal animals, but only to those with rickets, *i.e.*, in such cases where either a labile equilibrium or a disturbance of the mineral equilibrium already existed.

6.—The Therapy.

The success of the Ca.-therapy in men in those functional disturbances that are characterised by spasmophilitic symptoms, and in which the nervous and muscular hypersensibility—also one of the principal symptoms in tetany—was a reason for trying this therapy in grass staggers.

In many cases of pure grass staggers in the spring of 1928 an intravenous Ca. Cl_2-injection has brought about recovery. In the spring of 1929 more than 100 cows, probably nearly 200, recovered by means of this method[31]; frequently within a few minutes.

Cases of recovery also took place in which there was not directly a total recovery, although the tetany attacks did not recur after the injection; the animals, however, continued to manifest nervousness and inappetance during the first few days. These animals recovered within a few days on being kept calm (in the cow-house). Frequently Ca. Cl_2 was given per os during these days. It is not advisable to feed these animals on grass during such a period.

In a few cases no recovery followed after a Ca. Cl_2-injection. This could be due to the intense violence of the attacks[32], or to the fact that the treatment had been applied too late, or because it was not a case of pure grass staggers; or else perhaps it was a combination of grass staggers and other derangements.

It became evident in many cases of grass staggers that a smaller dose of Ca. Cl_2, than is usually applied in cases of milk fever, is sufficient. Instead of from 40 a 50 gr. (the dose mostly used in Holland in milk fever), 20 to 30 gr. or even 15-18 grams of Ca. Cl_2, aq., can be recommended[33].

The discovery that a very low Mg.-content of the blood-serum is found in grass staggers, naturally provokes the

question whether it would not be advisable to give an injection of a magnesium salt in cases of grass staggers.

In some cases of grass staggers Mg.-salts (Mg. Cl_2 and Mg. So_4) have sometimes been injected at a time with Ca. Cl_2. It stands to reason that it is not possible to form any definite opinion, as we have only a few trials as our basis; the results were not always encouraging. However, it is well to bear in mind that the Mg.-injection was given when other methods failed to help; therefore it is not at all improbable that in these cases pure grass staggers was not present.

Up to the present no trial has been made with parathormon, in cases of grass staggers. It seems questionable whether one is assured of a rapid action, as is so often required, in grass staggers. It is quite conceivable that parathormon will assist the action of Ca. salts, and prevent recidivism. There is also much reason for trying an injection of D. irtamine for the same purpose. Recurrence of the attacks in grass staggers is a drawback, especially because in such cases a therapeutical treatment has to be very quickly applied. The owners ought always to receive strict injunctions that it is necessary to keep the animals under observation after the injection, and they should be warned to send immediately for veterinary help should alarming symptoms be manifested.

It stands to reason that we have to try and find other calcium-salts, more especially because of the drawback that Ca. Cl_2, which comes out of the veins, is the cause of necrosis.

The most expedient preparation seems to be the calcium-gluconate (calcium Sandoz) which can, according to the advertisements, be applied either orally or intravenously, as well as intramuscularly and subcutaneously[34].

It is injected in a 10 per cent. solution. The ampulla which are placed upon the market for this purpose are expensive.[35].

Before concluding my remarks on the therapy, I must emphatically state that we do not know the mechanism of the favourable action of a Ca.-injection. The effect is surely not exclusively due to an increase of the Ca.-content of the blood. Probably it acts on the automatic nervous system and improves thereby the functioning of several organs.

When perusing our researches in connection with grass staggers, we shall, among other things, try to find out what is the principal etiological factor.

I feel especially indebted to Mr. A. Emmerie, Mr. E. Le Grand and Mr. H. Hooghoudt for the detailed analytical work that they executed, and further also to Dr. L. Seekles who, besides executing the determinations of the Ca.-ions in the blood-serum, also gave me his co-operation in so far that I repeatedly enjoyed the advantage of being able to exchange ideas with him in connection with the problems of the etiology and pathogenesis of grass staggers.

References *(continued)*

(14) One may assume that when the permeability of the cells and tissues is modified, owing to diminished vitality, the chance of poisons or micro-organisms to penetrate is all the greater. We must regard the permeability as being the effect of a physiological regulation, so that it can change continuously.

(15) *Munch. Med. Wochschr.*, 75, 2127 (1928). *Proc. Soc. Exp. Biol. and Med.*, 1927, 833 and *J. infect. dis.* 38, 249 (1926).

(16) At a later period we hope to communicate our own experiments, which produced grass stagger symptoms in normal cattle by injecting them with substances which cause the blood calcium to diminish, together with our pharmacological experiments with cattle in connection with grass staggers and milk fever.

(17) *C.R. Soc. Biol.*, 99, 1264 (1928).

(18) *Arch. f. Exper. Pathol.*, 32, 161 (1892) and *Amer. J. Physiol.*, 21, 259 (1908).

(19) Corlette assumes (the *Veter. Journal*, Nov., 1928, p. 507) that the protective action of the liver is disturbed by a shortage of Ca, and that likewise, just as in the fistula of Ecks, an insufficient amount of blood, freed from noxious substances, will circulate.

(20) *Boll. Soc. Ital. Biol. Sper.*, 3, 763, 766, and 768 (1928).

(21) *Amer. J. Physiol.*, 87, 124.

(22) *Proc. Soc. Exp. Biol. Med.*, 21, 523 (1924).

(23) *Amer. J. Physiol.*, 84, 583 (1928).

(24) *Amer. J. Physiol.*, 84, 176 (1928).

(25) It would be interesting to investigate whether rapid changes of the barometer can be of influence. It seems that a vagotonic condition becomes worse if such changes occur.

(26) See *T. v. Diergeneeskunde* Dutch Veterinary Journal), 1928, my article on Paresis puerperalis.

(27) *Klin. Woch.*, 1929, p. 794. The detailed treatise will appear in the *Zf. Exper. Med.*

(28) See my paper in the *T. v. Diergeneeskunde* (Dutch Veter Journal), 1928, on Paresis puerperalis.

(29) *Am. J. Physiol.*, 86, 633 (1928); *J. Biol. Chem.*, 73, 665 (1927); 74, 247 (1927); 78, 181 (1928); 81, 65 (1929); 84, 501 (1929).

(30) Jones and co-workers (*J. Biol. Chem.*, 86, 267) found that a marked hypercalcæmia can be produced rapidly in parathyroidectomised dogs by the administration of large doses of irradiated ergosterol. These dogs could be kept apparently in good health by this drug. Consequently the drug that cures the symptoms of rickets also prevented tetany after the removel of the parathyroids.

The experiments of Morgan and Garrison (*Journ. Biol. Chem.* 85, 687 demonstrate a relationship between the effect of parathyroid extract and the presence of vitamin D in the ration. We cannot yet interpret these findings, but we must conclude from them that the two syndromes must have a close connection with each other.

(31) Perhaps it is necessary to be careful when injecting very old cows with Ca. Cl_2. I heard of a case of an 18-years-old animal that did not stand an injection of 50 gr. Ca. Cl_2 in a 20 per cent. solution two days after parturition. It is always advisable to control the heart before and during the intravenous injection of Ca. Cl_2.

(32) According to the opinion of some veterinary surgeons, there is in violent cases of grass staggers with a rapid and fatal termination often a very slight decrease in the milk yield, while on the other hand, in cases that are less violent, a sudden decrease in the milk yield often occurs. These last cases, it seems, may often be cured by applying Ca. salts orally; among others, lactate, even without an injection of Ca. Cl_2.

The Veterinary Record.
May 24th, 1930.

Grass Sickness.

The season approaches when, in Scotland, the farmers are again becoming anxious as to the well-being of the equine section of their live stock. The dreaded scourge of grass-sickness comes, like the thief, without warning, and deprives them of varying percentages of their horse stock, even as much as 100 per cent. in some cases. In their season of trouble they are apt to express their feelings in the brief, sardonic observation, "Aye, ye're nae farrer on wi' this trouble!" Unfortunately, we have to admit that we have made little progress of any value to the owner, either in the therapeutics or prophylaxis of the disease. Many efforts have been made to clear up the etiology, but hitherto without success. Similarly, many experimental measures have been adopted to obviate the recurrence, but these have as yet no apparent value.

The area of incidence seems to be increasing, but this may not be due to an extension of the affected areas, but may arise in some cases from more careful observation and in other cases, it is to be feared, from wrong diagnosis. The late Director of the Moredun Institute, Mr. W. A. Pool, prepared a most interesting map showing graphically the areas of incidence in Scotland. Collected statistics show that about 800 cases occur in Scotland annually, and these almost entirely in that promontory between the Moray Firth and the Tay. If we consider the number of horses lost annually in that area from grass sickness, it may not seem a very high percentage, but when added to the normal death rate it is of considerable economic importance. The incidence, too, does not fall equally, and some unfortunate farmers have been left without a single horse in one season. There is one mitigating feature about it, *viz.*, that it seldom revisits a farm. It rather grants a few years' respite and selects fresh fields and pastures new. But this very feature of shifting location and erratic incidence in itself complicates the study of the disease. Many farmers, escaping for a number of years while their neighbours suffered severely, have concluded that this was due to some quality of land or some system of farming. A great many have had, perforce, to change this complacency to chastened reflection.

Much thought has been given to the question of grass sickness since the late Principal Dewar and Mr. T. M. Inglis, of Forfar, presented at a meeting of the Angus Association their first report on the etiology of the disease, attributing it to alsike clover. The theory of botulism was popular for a time, then Professor Gaiger put forward his suggestion of relationship with Borna disease. The general view to-day is the nebulous one that some indefinite toxin, in some way connected with pasture, is responsible for the interference with the parasympathetic nerve supply. In the *Veterinary Record* of May 10th, 1930, Mr. O. Stinson, of Appleby, suggests that it is of simple dietetic origin due to excess of protein. This view has been discussed before, although never published. Dr. Greig published a short article in 1927 putting forward the theory that the disease was a sympatheticotonia due to a toxin endogenous or exogenous. Drs. Sclater and Reynolds, of Edinburgh University, collaborating with Mr. W. A. Pool, of the A.D.R.A., reported that they had found an acute degeneration of the fibres of the vagus taken from cases. This confirmed a belief that the vagus was the structure most affected. While one might admit that an auto-intoxication might stimulate the sympathetic, one would hesitate to suggest that it would destroy the structure of the vagus, but that is a question for the neurologist. The possibility of an auto-intoxication producing the condition was considered by all the investigators, but

(33) *Popescu-Inotesti, C.R. Soc. Biol.*, 93, 752 (1925) (see Lloyd in *Brit. Med. J.*, 1, 1928) say that Ca. Cl_2 injected intravenously acts on the vegetative nervous system in man, in so far that it causes sympathetic excitation (tachycardia, hypertension, mydriasis, hyperglycæmia, sometimes tachypnœa) after a small dose (0·1-1 gr. calcium-chloride), while a large dose (1·5-4 gr.) causes excitation of the parasympathetic, with bradycardia, miosis (contraction of the pupils) and bradypnœa.

The observations of Lloyd, *Brit. Med. J.*, 1, 1928, p. 662, are likewise of great interest. A sino-auricular heart-block was observed, by means of the electrocardiagram, after he had been injected (intravenously) with 4 c.c. of a 10 per cent. Ca. Cl_2 solution. After oxygen had been administered the heart began to beat once more.

(34) Our experiences with cows do not agree with this statement.

(35) We have not yet succeeded in preparing a 10 per cent. solution of this preparation which is stable. Usually crystals separate out, as the solution stands during several days.

was not acceptable to them as it did not fit in with a careful study of the epidemiology and with other features.

It would now appear that early results from any work are not to be expected. At the beginning of the investigations it appeared as if a solution would be reached in weeks. To-day we are safer to think in terms of years. To us, it seems that successful results can only follow a more thorough study of the pathology, along with a more intimate knowledge of the obscure metabolism of the horse. Some knowledge helpful to the matter and especially useful as a guide to its prophylaxis, might be gathered from a more careful study of its epidemiological features.

We might study the following queries:—

Why grass sickness concentrates on the area north of the Tay and is hardly seen south of the Forth? Why has it been so prevalent during the past 15 years and so rare before? Why dry warm weather favours the disease and cold wet weather inhibits?

The more closely we study the problem, the more contradictory we find many features of the disease.

Children's Deaths in Lübeck.

Fourteen of the 246 infants who were given the Calmette prophylactic tuberculosis treatment in Lübeck have now died, and a number are still critically ill. Public opinion in general and medical opinion in particular are keenly interested in this affair. A rather vaguely worded report made by the investigators sent from the Reich Health Office in Berlin had appeared to place the blame on the cultures as sent from the Pasteur Institute in Paris, of which Dr. Calmette is sub-director. The Institute indignantly repudiated this suggestion.

Dr. Wirth, the Minister for the Interior, made a statement to the Reichstag Budget Committee recently.

The official investigators had, he said, decided that the deaths were probably due to tuberculosis caused by the treatment. The question why the cultures had had this disastrous effect, in contrast with all previous experience, remained open, and further inquiry alone could determine whether they had undergone some incalculable biological change or whether culpable negligence was at fault. In the latter case those responsible would be brought to account. Meanwhile, all the State Governments had been recommended not to use the Calmette process pending the elucidation of the facts.

The Lübeck Public Prosecutor has begun proceedings for manslaughter by negligence against persons unknown.—*The Times.*

Army Veterinary Service.

London Gazette—War Office—Territorial Army.

May 16th.—Lt. M. Bridgeman to be Capt. with seniority, Dec. 6th, 1927 (May 17th); Lt. H. B. Allan to be Capt. with seniority, June 26th, 1929 (March 8th).

Personal.

Captain H. A. Idenden, Senior Veterinary Officer, Trans-Jordan Frontier Force, has arrived in England on three months' leave.

Clinical and Case Reports.

Arab Stallion Castration.

By H. A. Idenden, Captain, R. of O., R.A.V.C. Senior Veterinary Officer, Transjordan Frontier Force.

Subject.—Grey Arab troop stallion—11 years old.

Method.—Actual Cautery.

This horse becoming savage, castration was decided upon, he being a good type of Arab troop horse and the Company Commander being loth to cast him for vice.

After being put on a diet of wet bran for a few days, he was cast and chloroformed, taking some 3 oz. of chloroform.

The left testicle was removed without difficulty, and, beyond being of abnormal dimensions, nothing unusual was observed; but on handling the right, it was found to be of hard consistence and, incision being made into the scrotum, the testicle was found to be rigidly adherent to the inner aspect of the scrotal wall, necessitating release by dissection, and separation with the fingers.

This adhesion was found to be persistent along the epididymis and the spermatic cord, both being closely adherent to the wall of the canal, with the cord tremendously thickened.

This, again, was separated with fingers as far up the cord as possible; the thickened cord was then pulled out as far as posssible, the claws applied and the testicle removed with the hot iron, leaving a stump as hard and thick as one's thumb. Hæmorrhage was arrested by touching with the hot iron, and the end of the cord sealed with resin, the horse then being allowed to rise.

With the exception of a little swelling, this horse did remarkably well, being ridden at duty within 20 days of being operated upon.

In parenthesis, it is worthy of note how quickly these Arab stallions recover from the actual operation.

I have now castrated some thirty of these horses, many of them 11 or 12 years old, and one 15 years of age, and all have done well as far as the operations were concerned, all being ridden within 15 days, but in many instances there is considerable constitutional alteration.

A Case of Anthrax Coincident With One of Possible Poisoning.*

By J. Adamson, Junr., Royal Veterinary College, London.

Subjects—(1) A roan Shorthorn heifer; (2) A red Shorthorn heifer.

History.—Little information of value as a history could be obtained. The red heifer had been found dead, and the roan heifer was ill with the symptoms as described in the subsequent notes.

On the day that war was declared in 1914 a number of deaths had occurred in this field, but no action was taken to ascertain the cause of these.

Symptoms.—The roan heifer was found lying down and

* Case submitted for award under the N.V.M.A. Clinical Prize Scheme for Students (1929).

in a very distressed condition. She was continually champing her jaws with a frothy discharge from mouth and nostrils. Extremities were cold; visible mucous membranes were pale; temperature was 102° F.; respirations were 80 per minute and very shallow. The animal was totally blind but was able to rise with assistance, when progression took place in a backward direction and after a few steps she fell down again.

The red heifer was about three hundred yards from her sick companion; she lay on her left side with head and limbs extended. The abdomen was distended with gas, and there was a sparing amount of blood-flecked exudate in the nostrils. Death appeared to have taken place a few hours previously.

Diagnosis and Prognosis.—Poisoning was suggested as the cause of death in both cases. Examination of the field was made for possible sources, but nothing of value was found. Little hope was given for the recovery of the roan heifer, and two ounces of chloral hydrate in some treacle were given to control symptoms, and as much comfort and shelter provided as was possible.

Blood smears were made from the red heifer and stained with methylene blue. Microscopic examination showed a number of rod-shaped bacilli morphologically indistinguishable from the *Bacillus anthracis*. This diagnosis was subsequently confirmed.

Course.—The following day the roan heifer was found to be still in the same position, and coma had now set in. The temperature was unchanged, and the animal was getting progressively worse. An examination of its blood was made at the time of this visit but the smear showed no organisms.

Death took place the same afternoon and blood smears again gave a negative result.

Post-Mortem.—Nothing of diagnostic value could be seen. There was a slight inflammation of the reticulum and omasum.

Remarks.—The cause of death in the case of the red heifer might easily have been overlooked because of the symptoms present in the roan heifer.

Urinary Calculi in a Bull.*

By F. J. Kinghorn, Glasgow Veterinary College.

Subject.—A yearling roan shorthorn bull.

History and Examination of Patient.

The animal was in a loose box, the food consisting of cut meadow grass and a small allowance of linseed cake and cut green oats. An ample supply of drinking water was provided. For some time previous to the first visit the owner had noticed that the animal was not thriving, but, as he said, he thought the animal was merely "off colour" and he did not pay much attention to it. Later on, however, he became worried as there was no improvement, and decided to have professional advice.

On examination, the animal appeared to be in fair condition. At two or three minute intervals he showed signs of abdominal pain, kicking at the abdomen and groaning. There was a slight sweat and the animal alternatively rose and lay down. The pulse, heart and visible mucous membranes were normal. Respiration was slightly accelerated and appeared difficult. The temperature was 103°. On auscultation, no action of the stomach or bowels was apparent. Fæces were deficient in amount and hard and dry, and were passed with difficulty. As far as could be determined the urine was at this stage normal.

Diagnosis.—Stasis of the bowels and rumen.

Treatment.—The animal received the following dose per stomach tube:—

Sodii chlor.	ʒxii.
Formaldehydi	ʒii.
Chloral hydras	ʒiii.
Theriac	lb. ii.
Aquam ad.	C. 1·55.

On the following day, the animal appeared easier but the physic had not acted and there was as yet little action of the bowels and stomach. No water was being taken. The animal received a dose of ammon. carb. in bolus form and about one and a half gallons of warm water per stomach tube. Rectal examination revealed the bladder to be somewhat distended and the rumen doughy.

Next day the physic acted and the animal appeared much easier and water was taken and a little food. Twelve days later the owner 'phoned saying that the bull was worse. On arrival he was found to be showing symptoms of abdominal pain but no sweating and no temperature. Water was passed in small quantities, accompanied by arching of the back and symptoms of pain. A thorough examination was made and a calcareous deposit was found in the preputial hairs. Taking into consideration, along with the symptoms shown, a diagnosis of urinary calculi was made. At this stage it was found that the animal was insured and as he was rapidly losing condition slaughter was advised. This, however, for some reason unknown to the V.S., was delayed.

Three or four days later a swelling about 10-12 inches and of a fluctuating nature developed just behind the preputial orifice. In the following 3-4 days it increased considerably in size and a smaller and similar swelling developed under the anus. The scrotum had an œdematous appearance. At this stage the bull was slaughtered and *post-mortem* revealed the following:—

Kidneys.—Showed hydronephrosis.

Bladder.—Contained a large number of calculi, varying in size from that of a pin's head up to the size of a hen's egg.

Urethra.—Contained calculi at intervals and in quantities at the points where swellings had developed on the living animal.

The carcass was in fair condition and the flesh was firm and untainted.

Remarks.—In the writer's opinion this case demonstrated the difficulty of diagnosing this type of trouble in the early stages. The symptoms shown at first were by no means definite and have often been seen in bovines affected with some form of stomach derangement. The unnatural mode of living and the restricted diet had probably a good deal to do with the onset, as the writer has seen the condition in rams living under similar conditions. In most cases of urinary calculi that the writer has seen, by the time that diagnostic symptoms were shown, the condition was too far advanced to yield to treatment.

* Case submitted for award under the N.V.M.A. Clinical Prize Scheme for Students (1929).

Abstracts.

[**Osteomalaci-Skravelsjuka (Osteomalacia).** H. Stalfors and Olof Swanberg, *Svsk Vet. Tidskr,* 1930, 3 and 4.]

The article deals with the occurrence of osteomalacia as it affects cattle in Sweden, together with the symptoms, results of bio-chemical and other examinations of blood and urines of the affected animals and the treatment. The disease is widespread, is seen mostly in the late winter and early spring and appears to have been first observed in the province of Dalecarlia where, it is estimated, 15,000 cases occur annually. The Swedish Insurance Company brought seven affected animals to the clinic in the Stockholm Veterinary College during 1929, for observation and possible treatment. From this material the writers have studied the affection from the following aspects:—

Symptoms; blood counts at intervals during the period of treatment; bio-chemical estimations of blood sugar, total ash, calcium, serum protein, together with urine analysis for protein and acetone. The treatment was symptomatic and the administration of sugar in solution *per os* or subcutaneously, to counteract the hypoglycæmia which was observed during the disease, led to rapid improvement in condition and is hence recommended as a therapeutic measure. The disease is known under the following names in Sweden: skravelsjuka, stelsjuka, torrolen, bentorka, träätaresjuka.

G. B. B.

[**Some New Observations and Experiments Concerning Sterility in Cattle.** Professor H. Stalfors (Stockholm) *Cornell Vet.,* XX, I, 1930.]

The author refers briefly to the general causes of sterility in cattle in Sweden (heredity, hygiene). The local causes of sterility are dealt with in some detail. As opposed to Hess on the one hand and Albrechtsen on the other, the writer advocates treatment, singly or combined, of the ovaries and of the uterus. Ovarian manipulation comprises chiefly expression of corpora lutea or of cysts. Sterility depending upon the presence of persistent corpora lutea proved most amenable to treatment, pregnancy having been brought about in 503 out of a total of 546 such cases. The effect on the ovary of the expression of persistent corpora lutea has been studied in the case of three cows which were slaughtered at varying periods after the operation. Microscopical examination of the treated ovaries led to an increased formation of follicles. In addition to this, figures are cited to show that in a majority of cases pregnancy, following ovarian treatment, has occurred in that horn of the uterus on the same side as the treated ovary which, the writer deduces, has given rise to the ovum eventually fertilised. These facts tend to show that expression of the persistent corpus luteum, rather than having any detrimental effect on the ovary, has a definite stimulant action. Concerning so-called uterine catarrh, Stalfors believes that it depends upon an atony of the uterine muscle and hence adopts the stimulant treatment described in the text. On the same lines the writer argues that the iodine irrigation method of Albrechtsen owes its action more to a stimulant action on the uterus wall than to any antiseptic property of the solution used.

Finally, salpingitis and ovarian transplantation are dealt with.

G. B. B.

[**Studies on the Control of Bang's Abortion Disease of Cattle.** C. C. Palmer. (*Deleware Sta. Bul.* 163 (1929), pp. 55, *figs.* 3). *Expt. Sta. Rec.*, April, 1930.]

This consists of a summary of 10 years' study by the station of methods for the control and eradication of infectious abortion of cattle. An attempt first made to control the disease by the use of living-organism vaccines failed of satisfactory results. The administration of acriflavine intravenously to some 10 animals positive to the agglutination test also failed of the beneficial results expected, although none of the reacting cows, some of which were recently infected animals, aborted their calves within a period of 2·5 years after the treatment.

The greater part of the bulletin consists of a detailed account of control and eradication work with the disease in ten herds with five of which a system of partial segregation of the positive and negative reactors was employed and with the other five a system of complete segregation. In the partial system the cattle were segregated at calving time only, while in the complete system positive and negative animals were segregated at all times. Both systems were used successfully in the eradication of the disease.

In the first of the partial segregation herds there was 40 per cent. infection at the outset, 4 years being required to eradicate the disease, which was accomplished with practically no additional cost to the owner. In the second of these five herds, in which the infection amounted to 10·8 per cent. and was increasing rapidly, the disease was brought under control within 2 years, no new cases having appeared during the past 4 years. In the third herd, in which only two reactors were found in the first test, no new cases appeared during the following 5 years under observation and no reactors have been found in the herd during the past 4 years. In the fourth herd, work with which was commenced when the infection was increasing rapidly, the disease reactors were being eliminated gradually. In the fifth herd, in which 25 of the 102 animals reacted, the disease was eradicated in 2 years.

In the first of the five completely segregated herds, in which the first test showed 103 reactors, or 37 per cent. infection, 18 months were required to eradicate the disease. In the second herd, of 35 animals, in which the work was complicated by poor co-operation, the disease was brought under control in 2 years. In the third herd, consisting of 135 mature cows and bred heifers, of which 40 reacted at the initial test, an occasional reactor continued to appear after it was thought that the disease had been eradicated, but there have been no reactors in the last three tests. In the fourth herd, consisting of about 30 pure-bred animals purchased from several scources, the eradication of the disease was not difficult when the herd was divided, no reactors having been found in the negative herd in 2 years. In the fifth herd, in the eradication of which a father and son pooled their dairy interests, the father taking the negative herd and the son the positive herd, the disease was eradicated successfully. Starting with a herd of 24

animals in 1924, 50 per cent. of which were infected with the abortion disease, the owners succeeded in establishing by 1929, or in less than 5 years' time, two negative herds of 20 animals each, exclusive of calves, by segregating the reacting animals, and in making no additions from the outside.

It is concluded that the method of segregation to be employed in the herd depends upon the circumstances surrounding the herd, such as buildings and amount of land available, finances of the owner, the value of the animals, the extent of the infection, the size of the herd, etc. If complete segregation of the reactors is not feasible, many variations of a modified plan of segregation may be put into practice, but the success of any plan depends upon the attention to details.

Under the heading of an abortion tragedy, an account is given of an attempt made to show the havoc resulting to a negative herd when the disease is introduced therein.

A list of 19 references to the literature is included.

[**Types of the Gärtner bacillus and its presence in Man and Animals.** Bahr, Louis (Copenhagen), *D.T.W.*, 1930, 38, 10, 145-8; *D.T.W.*, 1930, 38, 11, 165-9).

I.

The author collected 185 strains of *B. enteritidis* (Gärtner) from institutes in England, U.S.A., Germany, Austria, Poland and Denmark. Of these, 139 were of animal and 46 of human origin (enteritis). All cultures were tested for purity and if contaminated (only a few such) were purified.

All cultures consisted of oval, motile, Gram negative, non-sporing bacteria, growing in but not liquefying gelatine. All fermented the following "sugars"—glucose, maltose, xylose, dulcite, mannite and sorbite. Lactose, saccharose and adonite were not attacked and indol was not produced in sugar-free peptone broth.

Agglutination experiments were carried out, using sera prepared against the following bacteria: (1) paratyphoid A; (2) paratyphoid B; (3) Ærtrycke; (4) Schweinepest; (5) original Gärtner (Jensen, 1889); (6) Ratinbacterium (Type IV)' and (7) paracolonbacterium (Type III). The result was that each strain was agglutinated by one but usually by two or three of the sera, but not by all, or if agglutination did occur with more than three sera, then titre limit was not nearly reached. A definite specificity existed between the strains and the three Gärtner sera (5, 6 and 7).

For further differentiation the method of Better, Weigmann and Habs for the identification of *B. paratyphi B.* and *B. ærtrycke* was used. The following solution is prepared: Disodium phosphate 0·5 gm., ammon. sulph. 1·0 gm., sod. citrate 2 gm., sod. chlor. 5 gm., peptone (Witte) 0·05 gm. and distilled water 1,000 c.c. To this is added 1 or 0·5 per cent. rhamnose (or arabinose); pH=7·0. All strains were grown in the salt-peptone solution *plus* (*a*) rhamnose and (*b*) arabinose at 37° C., for the former for 16 hours and for the latter both 16 and 48 hours. The hydrogen ion concentration was then determined with methyl red as indicator, the colour reaction being red in some instances and yellow in others. It was thus found that all bacteria classified as the Gärtner bacillus did not behave in the same manner and could be divided up into the following groups:—

Group I.—Thirty strains (15 human, 9 domestic animal and 5 unknown).

Arabinose—broth+24 hours, 37° C.

Rhamnose—broth—12 days, 37° C.

" —peptone—salt—solution—yellow, 16 hours, 37° C.

Arabinose—peptone—salt—solution—red, 16 hours, 37° C.

Group 2.—Four strains (three calves and one ox.)

Arabinose—broth+24 hours, 37° C.

Rhamnose—broth—12 days, 37° C.

" —peptone—salt—solution—yellow, 16 hours, 37° C.

Arabinose—peptone—salt—solution—red, 16 hours, 37° C.

Group 3.—101 strains (82 domestic animals, 17 human, 2 unknown.)

Arabinose—broth—6 days, 37° C.

Rhamnose—broth+24 hours, 37° C.

" —peptone—salt—solution—yellow, 16 hours, 37° C.

Arabinose—peptone—salt—solution—yellow, 16 and 48 hours, 37° C.

Group 4.—Fifty strains (28 rats, 2 water-rats, 1 mouse, 6 domestic animals, 14 human.)

Note: + = fermentation; - = no fermentation.

It will be observed that in Group 1 the strains are of human and less frequently (domestic) animal origin; in Group 2 of (domestic) animal origin only; in Group 3 of (domestic) animal origin usually and less often human; in Group 4 of chiefly rat and mouse origin, occasionally human and still less seldom (domestic) animal.

II.

This part of the article deals with the use of a culture for the extermination of rats. This is called "Ratin-culture" and belongs to Type IV (? Group 4.) It has been proved experimentally that it is non-pathogenic for the domestic animal and no instance of infection in man or animal has been proved against it when used as a vermin exterminator in a large number of parts of Denmark. Its use should, of course, be accompanied by the employment of a common sense procedure, as the placing of the culture out of reach of young animals and children. In an investigation of 17 rat pastes, 10 contained no or quite worthless bacteria, 3 contained *B. paratyphus B.* and 4 the "ratin" type of Gärtner's bacillus.—J. H. M..

[**The Control of Bovine Tuberculosis in Wurtemburg.** (Gminder, Adolf, *D.T.W.*, 1930, 38, 11, 163-5.)]

Before the war a voluntary eradication scheme was in operation, but this was discontinued during and after the war. In 1926 an official notice was given out *re* the danger of cases of open tuberculosis. This resulted in a large increase in the number of suspected tuberculous excretions sent for examination. It was found that the animal experiment (guinea-pig inoculation) picked out only 7-8 per cent. of specimens negative to microscopical examination. Thus the microscope was effective in 92-93 per cent. of cases and by the use of the enrichment method of Scharr and Lentz this was increased to 96 per cent. Attempts to shorten the time of the animal experiment by "tuberculinisation" of the guinea-pigs failed. By employing an elective malachite-green-egg medium one could, in 8, 10,

or 14 days, demonstrate tubercle bacilli culturally from microscopically negative excretions. Further, the animal test could be shortened by injecting the material direct into the leg lymph glands, extirpating these at an early date and examining smears for tubercle bacilli.

In the control of open tuberculosis it is necessary to make use of all means available, *e.g.*, the examination of throat and tracheal exudate. The veterinary surgeon plays a very important part, as it is he who picks out the suspected animal and carries out the field end of the campaign.

J. H. M.

[**Studies on Infectious Mastitis, with special reference to Streptococci.—First report,** G. D. Brigham, J. G. McAlpine, and E. O. Anderson (*Connecticut Storrs Sta. Bul.* 158 (1929), pp. 285-311. *Exp. Sta. Rec.* March, 1930.]

This is a report of preliminary work conducted, in which the number of animals injected with bacterins as curative and prophylactic measures in mastitis is considered too small to warrant the drawing of any general conclusion. It is considered, however, that the following statements are justifiable, namely, that (1) autogenous bacterins, even when given in small doses, appear to exert a marked curative action in severe cases of mastitis and (2) a prophylactic vaccination at intervals of approximately three months has apparently been efficacious in at least two of the herds. To be effective, however, the bacterin must be applied to all of the animals in the herd.

An epidemiological study was made of four dairy herds in order to determine the presence of hæmolytic streptococci in the individual animals. It was found that a large majority of the cows were eliminating alpha and beta streptococci, and that these types persisted in many animals for the entire period covered. Even after dry periods of 6 and 12 months the organism was present in the milk. A few animals have never revealed evidence of infection with hæmolytic streptococci, although a progressive infection appeared to exist in each of the four herds. First calf heifers were generally free from the infection, although some calved with streptococci present in the udder. The beta and alpha types, as a rule, appear separately in an individual cow's milk, although they may interchange or occur simultaneously. Disappearance of the types from milk has been noticed, and in a few cases the organism has failed to return. The transitory appearance of the alpha type in the milk of otherwise negative animals has also been observed. In all probability these were contaminants from the milker's hands and were of no significance.

[**Vaccination in Fowl-cholera-infected Flocks by means of a Serum-vaccine-mixture.** Saxinger, George, *D.T.W.*, 1930, 38, 15, 230-1.]

This method was very effective in controlling the disease and gave much better results than serum alone.—J. H. M.

[**The Etiology and Therapy of Milk Fever.** Hink, A., *D.W.T.*, 1930, 38, 15, 231-2.]

Although there may be alterations in the blood sugar or blood calcium content, this is not the cause of milk fever. It is the result of the vaso-motor excitation which produces the disease.—J.H.M.

National Veterinary Benevolent and Mutual Defence Society.

Annual Meeting at Manchester.

The Annual Meeting of the National Veterinary Benevolent and Mutual Defence Society was held at the Grand Hotel, Aytoun Street, Manchester, on Thursday, March 27th, 1930, at 2.15 p.m.

The Chair was occupied by the President (W. Woods, Esq., F.R.C.V.S.) and other members present were Messrs. J. Lindsay (Vice-President), J. Holroyd, E. H. Curbishley, G. H. Locke, L. W. Wynn Lloyd, F. Hopkin (Hon. Treasurer), R. C. Locke (Assistant Hon. Secretary) and Col. Brittlebank (Hon. Secretary).

Apologies for unavoidable absence were received from Messrs. Jackson Young, A. W. Noel Pillers, John Spruell, H. Sumner Senr., and Prof. Hobday.

The minutes of the last Annual Meeting were taken as read.

Election of Officers.

President.—It was proposed by Mr. G. H. Locke, seconded by Mr. Curbishley, and unanimously resolved that Mr. W. Woods be re-elected President for the ensuing year.

Mr. Woods: "The amended Rules of the Society do not make it compulsory for the President to give a formal address, as previously, and I may be somewhat out of order in making a few remarks which may be used for propaganda purposes, but I ask your indulgence.

Although the Society has now as large a membership as ever in the past, due to a small but steady increase during the past few years, it is still far from proportionate to the whole profession. It is surprising that every practising veterinary surgeon does not become a member and it makes one think that either the Society's activities are not sufficiently known, or the advantages of membership of the Society are not fully realised. It is remarkable that for an annual subscription of 10s. 6d., one may be defended in a court case, should one arise, and the Society is in a position to secure the services of the most eminent members of the veterinary profession, if necessary, to assist in the defence. Where do the same facilities exist elsewhere?

I may point out that there is no other organisation within the profession which gives such benefits. It is true that there is the Victoria Benevolent Fund, whose headquarters are at 10 Red Lion Square, but that is essentially a benevolent fund and the two Societies work in close harmony so far as benevolence is concerned. But the point I wish to emphasise is the Section of our Society dealing with Defence and one could not do better than quote from the preamble to the Rules:—

"In consequence of many vexatious and unjustifiable actions at law having been threatened and sometimes instituted for alleged depreciation in the value of horses and other animals as a result of any act or omission on the part of a veterinary surgeon or his qualified assistant, and because it has been repeatedly sought on the part of the public to make the members of the veterinary profession not only responsible for their opinions (fairly and honestly expressed in the discharge of their duty), but also to hold them responsible for the accidents resulting from

necessary surgical operations; and considering that the veterinary profession has hitherto been without a fund from which its members might be assisted in their defence against such vexatious and unjust lawsuits . . . . . "

Many practitioners may think that they or their assistants are so efficient that an action will never be brought against them. That may be, but nobody is infallible and it is often a costly business to prove one's case or defend oneself successfully in the event of a malicious or unjustifiable action; also, there must surely be some gratification in knowing that one's subscription, whilst covering oneself in this manner, is also being applied to the assistance of less fortunate professional brethren or their dependants.

I want again to assure all my listeners that no application for assistance is turned down without the fullest investigations being carried out. The incomes of both the " Victoria " and the " National " funds are taxed to the fullest extent and our Treasurer told us not long ago that we were overspending our income; every penny we can spend is being applied to benevolent purposes, and you can rest assured that the persons who are receiving this assistance are deeply grateful.

In conclusion, permit me to say how much I appreciate the honour you have paid me in re-electing me President of this Society. I thought that I had occupied this position long enough, but if it is your wish that I continue for another year I shall be only too glad to do all in my power to further the objects in view.

I do appeal to all members of the veterinary profession to help us in the work we are doing in the interests of those less fortunate, at the same time helping themselves by insuring against that catastrophe which may arise at any time.

Vice-President.—Col. Brittlebank proposed, Mr. Curbishley seconded, and it was unanimously resolved that Mr. J. Lindsay, Dumfries, be re-elected Vice-President for the ensuing year.

Council.—The following were elected as the Council of the Society for the ensuing year: —

Mr. A. W. Noel Pillers, Liverpool; Prof. F. T. G. Hobday, London; Mr. J. Holroyd, Blackburn; Mr. E. H. Curbishley, Alderley Edge; Major J. H. Wright, Manchester; Mr. J. Spruell, Manchester; Mr. D. Imrie, Glasgow; Mr. J. Clarkson, Garforth, Leeds; Mr. C. Hartley, Lincoln; Mr. W. D. Rees, Penycraig, Glamorgan; Mr. W. Shipley, Great Yarmouth; Mr. W. K. Townson, Peterborough; Mr. L. W. Wynn Lloyd, Carnarvon; Major W. G. Burndred, Hanley; Mr. G. H. Locke, Manchester; Mr. H. Sumner, senr., Liverpool; Mr. W. Packman, Bury, and Col. J. W. Brittlebank, Manchester.

Hon. Treasurer.—In proposing the election of Major Hopkin as Hon. Treasurer, Mr. Woods said that, as President of the Society, he knew what a lot of work there was to be done in connection with the office and how well Major Hopkin had done it in the past, and it gave him especial pleasure in making the proposition from the Chair. Mr. Wynn Lloyd seconded and the proposal was carried unanimously.

Major Hopkin expressed his thanks for his re-election and stated that his object was to try and get a large sum of money for benevolent purposes. The fund had been growing gradually and he hoped that there would soon be an income that was worthy of the Society.

Hon. Secretary.—Col. Brittlebank said he thought it would be remembered that at the previous annual meeting of the Society he had signified his intention of relinquishing the office of Hon. Secretary and had indeed, at that meeting, agreed to carry on for another term only, and the time had now arrived when he wished to put that intimation into effect.

He tendered his thanks to the Officers and Members of the Society for their confidence and support during his period of office and said it gave him great pleasure to nominate the Assistant Hon. Secretary, Mr. R. C. Locke, for the position of Hon. Secretary. Mr. Locke had done a great deal of the Secretary's work in the past and he felt certain that the business of the Society could not be placed in better hands. He believed in letting the young members take office. Mr. Locke's father held the office for a great many years and it was the duty of the Society to elect Mr. Locke, junr., to the position.

Name.	Age.	Beneficiaries. Circumstances.	Grant.
A. A. ...	72 ...	Widow. Invalid. Income: £16 per year and Old Age Pension ...	... £1 per month.
M. B. B. ...	64 ...	Widow. Partially blind. Income: Blind Pension of 10s. per week	... £2 ,, ,,
K. E. C. ...	67 ...	Widow. Invalid. No Income	... £2 ,, ,,
E. B. C. ...	47 ...	Widow. Two sons aged 10 and 13½ years. Income: £2 weekly ...	... £2 ,, ,,
K. L. H. ...	77 ...	Widow. Income: 12s. 6d. per week from son and daughter, and Old Age Pension	... £2 ,, ,,
M. J. ...	77 ...	Widow. No Income	... £2 ,, ,,
M. L. M. ...	29 ...	Widow. Four sons, eldest 7½ years. No Income	... £4 ,, ,,
E. M. ...	64 ...	Widow. Invalid. Income: 11s. per week from son and daughter ...	... £2 ,, ,,
J. O. ...	54 ...	Widow. Invalid	... £2 ,, ,,
H. T. ...	66 ...	Widow. No Income	... £2 ,, ,,
M. A. ...	35 ...	Widow. Two children aged 11 and 9 years. No Income	.. £2 ,, ,,
E. B. ...	55 ...	Widow. Invalid. No Income	... £2 ,, ,,
M. D. ...	57 ...	Widow. Income: 11s. per week	... £3 ,, ,,
E. P. ...	76 ...	Veterinary Surgeon. Income: 17s. 6d. per week	... £2 ,, ,,
A. E. P ...	66 ...	Widow. Invalid. No Income	... £2 ,, ,,

Mr. G. H. Locke seconded the proposition, saying that he did so, not because it was his son who was nominated, but because he knew he could do the work. He added that his grandfather held the position for a great many years.

The President, Mr. Woods, supported the proposition, which was carried unanimously.

Mr. R. C. Locke, in accepting the office, expressed his thanks for the honour paid him and said he would do his best to fill the office to the satisfaction of the Society.

Auditors.—Major J. Adamson and Messrs. Litton Pownall, Blakey, and Higson, were appointed Auditors for the ensuing year.

Hon. Treasurer's Report.

The Hon. Treasurer (Major Hopkin), in presenting the Financial Statement for 1929, said that, so far as the Benevolent Section of the Society was concerned, more had been spent than had been received. On the Defence side there had not been a single case to defend and therefore there were no expenses in that respect. Thirty-nine new members had been enrolled during the year, four members had died, two had resigned, and four had been struck off through non-payment of subscriptions. The total number of members on December 31st, 1929, was 305.

The Auditors had inspected the Bonds, etc., deposited at the Society's bank, during the year, and had sent a letter certifying that they were in order. This letter was read to the meeting.

Mr. Curbishley moved that the Financial Statement for 1929 be approved and adopted, and that a vote of thanks be tendered to the Hon. Treasurer. Mr. Wynn Lloyd seconded, and the proposition was carried unanimously.

The meeting concluded with a vote of thanks to the President for his conduct in the Chair.

Increasing Egg Imports.

As a result of the increasing attention directed to poultry keeping and egg consumption in these Islands, a marked increase in the national demand is noted; for a time it was believed that, while the British egg was on the up grade, the imported variety was on the decline. So much, indeed, was true of the year 1929, when imports decreased by 200 millions, a very striking figure, until we remember that the annual import is over 3,000 millions. In the first three months of the present year the position has been less satisfactory, because, although home consumption has been maintained and home production is extending, imports have taken a big upward move. For example, the export of eggs from Denmark to this country in great hundreds averaged 88,500 for the first five weeks of this year against 67,700 in 1929, while for the second five weeks the figure was still more striking, 93,000 long hundreds against 29,500 in 1929. In the last two weeks of March the increased import was still maintained, and since the beginning of the year we have imported from Denmark alone 1,166,000 great hundreds, which is nearly half a million more than a year ago. Trade fluctuations are, of course, inevitable, but it is quite clear that the development of home production in this country down to the present is not adequate to the national demand. At the same time, it is satisfactory to find that while the import has increased so considerably, English eggs still lead the way in the matter of price. They are followed closely by the production of Northern Ireland, and the Polish and Chinese varieties remain, so to speak, at the bottom of the bill where prices are concerned. It is to be hoped and believed that the World's Poultry Congress at the Crystal Palace will provide a factor to correct the rather unfortunate relation between our own output and that of our competitors.—*Poultry Congress News Letter.*

In Parliament.

Important Veterinary Concerns Debated.

In the course of debate on the Agricultural vote on Monday, May 12th (the House of Commons in Committee of Supply):—

Dr. Hastings said: I desire to call the attention of the Minister to a relatively small, but I think important point, namely, the question of tuberculosis in cattle. My main interest in this question is on account of the disease which is conveyed to man through milk, but I cannot help feeling that it has an important bearing for the farmer as well, because a good many cattle, as I shall show, are affected by tuberculosis. The cattle that are most affected are cattle that give milk, and it is also the fact that the cattle which are affected do not as a rule contract the disease in their early years, but at the time when they are of great value to the farmer, that is to say, at the time when they are of middle age and are producing our milk supply. I would like to ask the Minister if he can give us any accurate estimate of the number of cows that are so affected. It is suggested that it must be nearly 1,000,000, and that 40 per cent. of the milch herds of this country are affected by tuberculosis. The examination of samples of milk, although they vary in different parts, shows something between 4 and 8 per cent. of those examined to contain the germs of this deadly disease—tubercle bacilli.

Dr. Vernon Davies: Is my hon. Friend speaking of generalised tuberculosis or of tuberculosis of any particular part of the animal?"

Dr. Hastings: I am talking about tuberculosis generally. Turning next to the question of how this tuberculosis affects human beings, I understand that there are every year somewhere about 2,000 deaths of human beings due to the bovine bacillus. That is a very large number, and, as far as we know, the germs reach the human subject in nearly every case by means of milk. It is said that in a few cases they may reach the human subject by means of meat, but they are relatively few. In addition to these 2,000 deaths every year, there are a great many individuals who are infected but, fortunately, recover. They number somewhere about 20,000 fresh cases every year. I ought perhaps to explain in passing that there are two forms of tuberculosis, the human type and the bovine type: I am speaking to-day exclusively of the latter. Certain organs are particularly affected by this bovine type of tuberculosis. It affects young children more than adults, and it is the cause of 46 per cent. of the cases of the glandular tuberculous disease. It is the cause of about 50 per cent. of the cases of lupus, and of about 66 per cent. of the cases of tuberculous meningitis; and any Member of the House who has ever seen a child suffering from tuberculous meningitis and has heard the cries of pain uttered by such a child will agree that it is an exceedingly terrible disease.

It is interesting to learn that this country stands first, not in tuberculosis, but in the number of cases of tuberculosis which are of bovine origin, with the one exception of Scotland. Scotland has the unenviable position of coming first in the list. I would like to ask what is being done to mitigate and cure this very terrible evil. It is suggested that by pasteurising the milk everything that is necessary can be done, but I want to say that by pasteurising an impure article you do not make it pure. The toxins of the bacteria are not destroyed by pasteurisation, while, in addition, there is very clear evidence that certain other changes take place in the milk as the result of pasteurisation. There is clear evidence that the calcium contained in milk is changed by any heating at all; it becomes less digestible and less easily absorbed. Moreover, certain direct experiments show that children do not do so well on milk that has been pasteurised. It seems to me, therefore, that, in the interests, not only of mankind, not only of all the citizens of this country who are liable to be infected, but also in the interests of the farmers, it is desirable that the Ministry should do all that is in its

power to eradicate tuberculosis from the cattle of this country.

I would like to ask what the Ministry is doing at the present time with this object in view. As far as I know its chief activity is centred in the Tuberculosis Order of 1925. According to this Order, it is the duty of the farmer or the veterinary surgeon who finds cows to be suffering from tuberculosis or any other similar disease of the udder, or who finds cows to be suffering from tuberculous emaciation, or from chronic cough and the clinical signs of tuberculosis, to report these cases. Then the local authority destroys these highly-infected cattle, and also destroys cattle which are known to be giving tuberculous milk, and their owners are suitably compensated. That Order has been in operation for the last three years. I have here the Annual Report of Proceedings under the Diseases of Animals Acts for 1928, and there are two previous Reports. From this Report I learn that in each of these three years somewhere about 1,700 cattle have been slaughtered, and it is interesting to note that, in 1928, 162 of those cattle, that is to say, 1 per cent., were so bad when they were reported that they died before there was time to slaughter them.

It is also interesting to note from this Report that, of the 347 cattle reported for giving tuberculous milk, no fewer than 264 showed, on *post-mortem* examination, nothing wrong with the udder; so that it is very clear that a cow can give tuberculous milk and be a public danger although there is no sign of disease of the udder. Also, it is noteworthy that the disease was reported to exist on just over 20,000 premises, and, when the cows in these premises were inspected, it was found that there was clear evidence of the disease in no fewer than 16,000 cases; so that, and this is my point, in four-fifths, at any rate, of the cases where disease was reported it was found by the veterinary inspectors and confirmed by *post-mortem* examination of the cattle.

Does the Minister believe that the eradication of tuberculosis in cattle is going to be effected by merely destroying a very small percentage of the infected animals, by destroying animals which were so badly infected with tuberculosis that one per cent. of them died before there was time to slaughter them? Is there any evidence that this is doing anything to reduce the amount of tuberculosis in cattle? Further, I should like to ask the Minister if he believes that the carrying through of this policy for any given number of years will be attended by success in eradicating the disease, because, in my opinion, nothing short of the complete eradication of the disease in cattle is going to give us what we need as a nation? It seems to me that what is being done under this Tuberculosis Order is merely to destroy cattle after a good deal of the mischief has already been done. I would like to ask the Minister if the other cattle which are living in the same places as the cattle that are slaughtered are also very carefully examined and tested with tuberculin, and also what disinfection of the byres in which these animals live is carried out after those that are condemned have been slaughtered.

A good deal has been said to-day about the importance of research, and I would like to ask the Minister if his Department is carrying out any researches as to the immunisation of calves against tuberculosis, and also whether anything is being done in regard to the rearing of a stock which is not susceptible to tuberculosis. I read in the Report I have just mentioned that two cows which the owners were unwilling to slaughter because they were of pedigree stock of good quality were allowed to go back, although giving tuberculous milk, to their owners to be used for breeding purposes. It seems to me that this is a very dangerous thing. Unfortunately, in this country as far as I can learn, only two per cent. of our herds are free from tuberculosis, and I would like to ask what the Minister is doing to assist the farmer—

Viscount Wolmer: Will the hon. Member say what his authority is for that damaging statement?

Dr. Hastings: My authority is the number of licences to produce Grade A (T.T) and Certified Milk. I can give the right hon. Member the figure, and the only sure indication, as far as I know, by which the Minister can be certain of the freedom from tuberculosis of the herds is the Grade A (T.T.) Certificate or the licence for the production of certified milk.

Sir A. Steele-Maitland: The hon. Member will forgive us if we wish him to correct a misunderstanding that might otherwise arise from his remarks. The particular fact may be as he says, but the natural interpretation that would have been put upon the remarks he made previously was, that only 2 per cent. of the herds of this country were free from tuberculosis. I am quite sure that would be a most damaging and serious misunderstanding to get abroad. I do not think that is what he meant, and it would be a very good thing if he had at once the opportunity of correcing it.

Dr. Hastings: I am very glad to have the opportunity. What I mean is—I can show by the figures—that only 2 per cent. of the herds of this country are known to be free from tuberculosis. They are known by the fact that the owners possess these certificates. Of the rest we do not know.

Sir A. Steele-Maitland: The hon. Member will not think I am interrupting him without reason, but the medical officers of health in a great many towns satisfy themselves as to the conditions under which the milk supply is produced so that there is a great deal more information as to the freedom from tuberculosis than is merely contained in the numbers certified under the Grade A (T.T.) Test.

Dr. Hastings: There may be more than 2 per cent., but as far as I know, only 2 per cent. have obtained these certificates. I very much hope that there are a great many more herds free from tuberculosis, but my point is this: I do not think the Ministry is doing all it should to assist the farmer to free his herds from tuberculosis. The farmer has to pay for the two certificates I have mentioned, and he has also to pay the veterinary surgeon to test his cows. In Denmark, which has been mentioned already in this discussion, I understand that the services of a veterinary surgeon and the tuberculin by which the cows are tested are both given free. It would be a very useful thing if the Ministry could see its way to do something of this sort in this country.

There is another method which I would suggest to the Ministry of freeing the herds from tuberculosis, a method used in America. I should like to know whether it has been tried extensively in any part of this country. It is the method of "Accredited herds." The farmer is assisted and given special facilities to free his herd from tuberculous cattle. His herd is tested every year, and, if he agrees, every assistance is given him to keep the herd free. As soon as accredited herds are produced in any number in any district, an attempt is made to produce an accredited area, where 75 per cent. of the farmers wish their area to become an accredited area, then compulsion is used with the rest so that all the herds may be free from tuberculosis. Because of the danger of infection this method of freeing the herds from tuberculosis is worthy of the Minister's consideration. In conclusion I should like to ask him, does he realise the great harm that is being done both to cattle and to man by bovine tuberculosis? Is he satisfied that what is being done by the Ministry at the present time is ever likely to clear this country from this terrible scourge?

Mr. De Rothschild: I should like to say a word on the very ill-considered action of the Government in closing the show-yards of the country to T.T. cattle. The hesitating retreat which the Government have beaten now has come too late for the "Royal," the most important show we have, the most important for foreign buyers, and for our bull breeders who wish to sell their cattle abroad. I am afraid that many of our breeders will give up their T.T. licences if the Government persist in these Regulations. It is a serious blow to stock-breeders, because, now that foot-and-mouth is disappearing to a certain extent, and there is a world shortage of cattle, these men were looking for better times.

The county authorities are constantly encouraged to increase their agricultural organisers and officials. It is unnecessary. If there is any spare money, it should be

spent on research. There are many practical gains to he got there. Besides swine fever, besides Johne's disease, besides erysipelas in pigs, there is a vast field for research and there are ailments which are equally grave and serious whose methods of treatment are at present unknown.

Expenditure has been slightly increased, but still it is very limited, and I was sorry to hear that the right hon. Gentleman was going to treat the Royal Veterinary College as if it were a voluntary hospital and that the Government was only providing £100,000 if £100,000 besides was coming from the pockets of the friends of veterinary science. We consider that the Royal Veterinary College is an institution of great importance which renders great service. I should like to stress the point that now, when there are so many microbial diseases, the man would deserve great praise and credit who could make one worm grow to-day where two grew yesterday.

Sir Harry Hope: The Ministry have a great field in which to work in the way of encouraging research. Science has an enormous field in front of it in endeavouring to understand and cure diseases not only in the human being, but also in the agricultural world. As regards human life, medical and surgical science has made enormous strides of recent years, but on the veterinary side, as regards agriculture, the same advances have not been made, and at the present time, diseases are afflicting all classes of herds, cattle, sheep and pigs, which are not understood, which are not accurately diagnosed, and for which no cure is known.

Enormous harm is done to many herds of pigs by swine fever, great loss is caused by a disease affecting cattle in the shape of tongue disease, and there is, of course, foot-and-mouth disease which has done such enormous injury to our cattle herds. As regards horses, we have a new disease in Scotland called grass sickness, a mysterious disease, which is afflicting our valuable horses. In all these directions the Ministry of Agriculture might well spend more money in encouraging research work and enabling the veterinary profession to make advances which would prevent these losses. I hope the right hon. Gentleman realises what I may call the bigness and gravity of this subject. If he would take the veterinary profession into his confidence and encourage it, put it upon a higher pedestal, we might bring a new science into the industry, and develop a knowledge of and a cure for the many diseases which now ruin so much of our stock.

Sir William Wayland: I do not want to enter into any political matter or to add criticisms based upon the paralysis of the agricultural industry, but to impress upon the Ministry that the sum allocated for investigating diseases of cattle is totally insufficient for the purpose. The Minister stated that it amounted to £50,000, and that it included all live stock. Unfortunately, in this country diseases amongst sheep have increased considerably, and there is no money whatever earmarked for investigation into sheep diseases, with the exception of about £200 or £300 which has been allocated to North Wales. I know that the Minister is very sympathetic, and that latterly he agreed to allow Wye College £500 a year for one year, and £350 a year for another three years. That is insufficient, and the college has had to find similar amounts from contributors.

I do not say that the Ministry of Agriculture should find every penny of the money required for research work, but they could find a great deal more than is the case at the present moment. What is a sum of £50,000 spread over the whole of the United Kingdom, when it is necessary to have three or four times, even ten times, the number of scientific investigators we have at the present moment? What have they been doing, or what has anyone been doing with any success, in regard to investigations into foot-and-mouth disease which has spread throughout the country and for which no cure has been found? I believe that very little investigation has been conducted, and, certainly, whatever investigation has been conducted, so far no success has been achieved. It is the same with regard to parasitical forms of disease in sheep. One of the veterinary officers of the Board of Agriculture has reported in the "Agricultural Journal" of the Ministry that these diseases are increasing considerably in his district, and that they bring in their train severe losses to the flockmasters. It is impossible for a flockmaster to investigate or to experiment, but the Ministry can certainly increase the amount which is at present allocated to scientific research. I know that the Minister is sympathetic, and I hope that he will be able to induce the Treasury to increase the amount because, as several speakers have said, no money can be better spent.

The remarks which were made by an hon. Member on the opposite side in regard to tuberculosis in cattle were totally unwarranted. I believe that the majority of the pedigree herds in this country are free from tuberculosis. Many more herds are being regularly examined, but the hon. Gentleman jumped to the conclusion that all those herds which were at present unexamined and had not been tested with the tuberculin test must be suffering from tuberculosis. It is a mistake. We are certainly, gradually and slowly, overcoming tuberculosis. I agree with him on one point. To pasteurise or sterilise milk is only to get rid of one evil by creating another. It is a mistake to imagine that by pasteurising milk and giving it to children you are going to do any good. I do not agree with his figures as to the number of children and others who every year are killed through drinking tuberculous milk. I think that his figures are very much overstated. Children and others are killed as a result of different causes, and I believe that milk does considerably more good than harm.

Viscount Wolmer: I would ask the Committee to consider the case of the Royal Veterinary College. My right hon. Friend the late Minister of Agriculture appointed a Departmental Committee to consider this matter. Since the present Minister of Agriculture came into office, the Departmental Committee have issued a very strong Report. This institution is the only one of its kind in England, and is of vital importance to the agricultural industry. The structure has been condemned by the local authority as being unsafe, and the Departmental Committee reports that £300,000 is needed to put it into a proper state of repair. The present position amounts to a national disgrace. The Government have offered £100,000, on the pound-per-pound basis. Where does the right hon. Gentleman think that the other £200,000 is to come from? His friend the Chancellor of the Exchequer has taken good care that there are not many surplus £200,000 lying about in this country. It is humiliating that, in regard to a pivotal institution of this sort, a Government which is spending hundreds of millions of pounds in other directions cannot find enough money to put the building into a proper state of repair. That shows how much interest the right hon. Gentleman and his colleagues take in scientific matters for the benefit of agriculture.

Another action which the right hon. Gentleman and his colleagues have done is to close the show yards of this country to tuberculin-tested cattle. I should like to add my protest to that of hon. Members on this side of the House against an action which is going to inflict grave injury on the whole movement for tuberculin-tested herds, and also grave injury to our great agricultural shows, for which this country is famous, which play such an important part in our agricultural industry.

The Reply.

Dr. Addison (Parliamentary Secretary) in the course of his reply, said: I think myself that the position of this country with regard to agricultural research is a discredit to an intelligent community. For the last few years we have been spending millions in compensation for animals which have been burned in connection with outbreaks of disease. In connection with foot-and-mouth disease we have spent £10,000,000 in compensation for animals which were destroyed because they were thought to be infectious. I am not blaming anybody. I am only stating the facts.

It was only the other day that we began to spend any substantial amount on research in the cause of the prevention of that disease, after we had poured at least £10,000,000 in the way I have described; and that remark applies also to our attitude with regard to many other animal diseases. I think it was the hon. Member for

Cambridge (Sir D. Newton) who said that if we could prevent the ravages of swine fever and other diseases, the agricultural industry would be saved not thousands of pounds but millions of pounds and that statement is no exaggeration. The Committee will remember that some years ago, in regard to medical research and scientific industrial research, the Government of the day, of which I was a Member, got together a committee to exercise a general oversight and to give comprehensive advice as to the lines which that research might take, the types of cases where research might be undertaken, and so on. We are now engaged in considering a provisional report with the idea of seeing whether we can adopt that kind of suggestion to agricultural research, and it seems to me, without being committed at this stage to the recommendations, which we have only seen for a few days, that the Committee offers the most helpful possible suggestions.

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The following questions and answers were recorded recently :—

Vivisection.

Mr. Freeman asked the Home Secretary whether any applications for licences to experiment on animals under the Cruelty to Animals Act of 1876 have been rejected by his Department during the 10 years ended December 31st, 1929; if so, how many; whether any such rejections were on the grounds that the experiments to be performed thereunder would involve suffering to the animals to be experimented upon; and, if so, how many?

Mr. Clynes: Applications for licences are refused and certificates are disallowed from time to time for various reasons, but I am not in a position to give the necessary information specified in the question. This could only be procured by a laborious examination of the files relating to vivisection; and I should not feel justified in directing such an enquiry to be made.

Mr. Freeman: Will the right hon. Gentleman consider withholding licences for further experiments which have been proved over a long period of time to be useless for the purposes in view, such as in the case of cancer.

On a subsequent occasion, Mr. Freeman asked the Home Secretary whether he would consider the desirability of withholding licences for further experiments on living animals which had been proved over a long period of time to have failed to reduce the mortality figures, as in the case of cancer.

Mr. Clynes: The answer is in the negative. Having regard to the amount of suffering and the mortality caused by cancer, I could not take the responsibility of a general refusal to grant licences for experiments bearing on cancer which are recommended by the scientific authorities under the Act.

Mr. Freeman asked the Secretary of State for the Home Department whether he is now in a position to state the number of experiments that were conducted by vivisection during 1929; and, if so, how many were conducted on dogs and how many when inspectors were present in each case?

Mr. Clynes: I regret that the figures are not yet available.

Sheep Scab.

Earl of Dalkeith asked the Minister of Agriculture the number of cases of sheep scab which have within the last 12 months been recorded in Scotland, England and Wales, respectively, and the counties in which the disease is most prevalent; and whether the Returns throw any light upon the probable means by which the disease survives in particular places and is disseminated into clean areas?

Dr. Addison: The number of outbreaks of sheep scab which have been recorded in Scotland, England and Wales during the 12 months ended April 30th, 1930, are 29, 294 and 287, respectively. The counties in which the disease was most prevalent were Cumberland, Lincoln (parts of Lindsey), Yorkshire (West Riding), Carnarvon, Denbigh, Merioneth and Montgomery. The chief factor in the spread of sheep scab is the mixing of clean sheep with affected sheep; often by the movement of sheep which have been exposed to this risk but which have not developed the disease to a stage at which the lesions are readily noticeable. I am sending the Noble Lord a Memorandum giving further particulars on the subject.

Horses (Export).

Sir R. Gower asked the Minister of Agriculture upon what occasions during the past three months inspectors of his Department have followed horses exported from this country for butchery purposes to the Continent; what places were visited by such inspectors; and the nature of the reports received by them, respectively?

Mr. N. Buxton: During the past three months officers of the Ministry have followed horses exported from this country to the Continent for immediate slaughter on three occasions, namely, on March 22nd to Holland, and on April 2nd and 25th to France. In Holland the Ministry's officers visited the quarantine stables, market and public abattoir at Rotterdam, and the public abattoirs at Amsterdam, Haarlem, Alkmaar, Leiden and the Hague; also private slaughter-houses at Zaandam, Hoorn, Enkhuizen and Den Helder. These include all the places so far as could be ascertained to which British horses are sent for immediate slaughter. At the private slaughter-houses, as well as at the public slaughter-houses, the horses are examined ante- and post-mortem by a veterinarian appointed by the State, who is also responsible for the general observance of the regulations, including method of slaughter. The officers of the Ministry reported that they were satisfied that the horses at all these places are adequately stabled, fed and watered, and that the law, which requires the use of the mechanical killer for slaughter in all cases in Holland, is efficiently enforced. In France, Calais, Boulogne and Paris (Vaugirard) were visited. As in Holland, so at these places adequate arrangements are made for the comfortable stabling and proper feeding and watering of horses awaiting slaughter. At Calais, the municipality, by regulation, require the use of the mechanical killer. At Boulogne it has been the practice for the past two years to slaughter all horses with the mechanical killer. At Vaugirard, the only horses exported from Great Britain for immediate slaughter there, from the beginning of 1929 to the end of April, 1930, were slaughtered (14 in number) with the mechanical killer, and an assurance was given to the Ministry's officers that this method will be employed in respect of all such horses.

Sir R. Gower asked the Minister of Agriculture whether, having regard to the conditions under which horses are ordinarily slaughtered at Vaugirard and to the number of horses of British origin which are slaughtered there, he will consider the desirability of making representations to the French Government regarding the matter?

Mr. Buxton: From the beginning of last year to the end of April, 1930, only 14 horses have been sent from Great Britain for slaughter at Vaugirard. These were shipped in April this year, and were all slaughtered with the mechanical killer. In the circumstances I do not think that there are any grounds upon which representations could be made to the French Government, as suggested by the hon. Member.

Sir R. Gower asked the Minister of Agriculture the number of horses exported from this country to the Continent for butchery purposes during the past two months; the places to which such horses were exported; and the methods and conditions by and under which they were, respectively, slaughtered?

Mr. Buxton: During the months of March and April, 444 horses were exported to the Continent for the purpose of immediate slaughter on arrival. Of this number 430 went to Holland and 14 to France. It is a statutory requirement in Holland that horses shall be killed with a mechanical killer. As regards the 14 horses to France, these were killed at the abattoir at Vaugirard, Paris, with a mechanical killer.

Foot-and-Mouth Disease.

Lieut.-Colonel Fremantle asked the Minister of Agriculture if his attention has been drawn to the reported discovery in Buenos Aires of an effective vaccine against foot-and-mouth disease; if he will cause inquiry to be made into the claim that with official aid entire immunity to the disease can be effected in two or three years; and if he will arrange for a systematic trial of this vaccine to be made on a wide and trustworthy basis in this country?

Mr. N. Buxton: I have seen a Press report of the nature indicated by the hon. and gallant Member. I have at present no further information, but I am making inquiries.

More Officials or Real Help for Agriculture?

The Agricultural Correspondent of *The Times*, in the issue of that paper of May 5th, critises strongly the latest endeavours of the Government to remedy the serious state of affairs in the farming industry.

"There is a widespread and increasing conviction in the country, in the centres best fitted to assess and view in true perspective things of the kind, that they will be ineffective. Broadly, the plan is to increase the number of officials, in the one case to advise farmers, and in the other to inquire into the terms of agreement they make with the workers they employ—to see that the full statutory wage is paid to men irrespective of the service rendered in return or other consideration that may induce arrangements acceptable to both and mutually advantageous.

"The provision of additional organisers sounds plausible, but in reality there is little defence for the scheme. The country was already well equipped with organisers, practically every administrative county having its organiser, who had done, and was doing, excellent work . . . .

"The steady multiplication of administrative officials is, in itself, a serious grievance, but the postion is aggravated by the parsimony observed regarding directions in which urgent, lasting, and fundamental service could be rendered, probably at less cost to the country. We talk glibly about research, but inasmuch as it is slow and uncertain in attracting public notice it is sadly neglected where public money is concerned . . . .

"There is also the deplorable condition of veterinary research in the country. The greatest section of the farming industry suffers severely and lamentably from inability to prevent, to allay, or to cure many ills to which live stock are subject, and which, in the absence of timely diagnosis and effective treatment, become progressively more prevalent and destructive. The Ministry of Agriculture has already given a handsome grant to help to retrieve the position in the study and treatment of animal diseases, but much remains to be done, and money could be spent to no better purpose in the agricultural interest than in veterinary research that would do something to alleviate the losses that arise from, say, breeding irregularities, Johne's disease, and liver ailments in cattle; liver, lung, parastic, and other diseases in sheep; swine fever and erysipelas in pigs; and minor illnesses generally. The starving of research, the source of information that is not already at the service of industry, is a grave error, especially when money seems to be available for duplicating the provisions for disseminating, or rather for repeating in useless redundancy, teaching already threadbare. The urgent need is for fresh knowledge of fundamental problems, and research alone can supply what is required—research that demands special qualifications in those giving themselves to it and qualifications that should be suitably rewarded."

From The Veterinarian,

January, 1830.

The Symptoms and Cure of Navicular Disease in the Feet of Horses.

By Mr. James Turner, Veterinary Surgeon, Regent Street, London.

(Read at the Veterinary Medical Society, December 4th, 1829.)

(*Continued from page* 443.)

I feel particularly anxious not to be misunderstood as to the kind of navicular cases that I have confidence in being able to cure.

With the acute or recent case, accompanied by very considerable lameness, there will be a better chance of a radical cure than with a chronic case, attended by only a slight lameness, though both such cases may, nevertheless, be within the pale of perfect recovery.

A large number which we are called upon to treat are cases of long standing, but yet not notoriously lame horses. Some of these that may not admit of a radical cure, owing to the duration of the disease and consequently defective organisation of the joint, may yet be relieved beyond the most sanguine expectations of their owners, by removing the rigidity of parts (as before detailed) exterior to the joint, and constantly furnishing emollients, in order to preserve elasticity. For this latter purpose, when in work, the old simple plan is very serviceable, of stopping the soles at night with cow-dung, and anointing the crust with neat's-foot oil.

On the other hand, there are many in the more advanced stages of navicular disease afflicted with a degree of lameness distressing to behold, which are greatly relieved by a directly opposite mode of treatment; such as giving way to the disease by allowing the heels to grow high, propping them up with thick heel shoes or calkins, and facilitating the efforts of the extensor muscles to catch the superincumbent weight, which thereby falls exclusively on the coffin bone, leaving the carious navicular bone exempt from its share of the burthen. This plan of treatment mitigates the animal's sufferings, but precludes the possibility of cure. Yet in such a lost case this is the most humane and rational mode of proceeding.

Mr. Professor Dick, of Edinburgh, has lately remarked that the ulcerated surface of the navicular bone, in protracted or severe cases, is frequently so extensive that, after the nerves have been divided, the *friction* between the tendon and the navicular bone completely divides the tendon, and the pastern falls to the ground. I advert to this for the purpose of showing that the *friction* here alluded to is not always necessary to constitute the failure of the operation in old and extreme cases of the disease; for I have, on several occasions, been an eye-witness to the giving way of the flexor perforans tendon at this part, immediately on the animals being allowed to get up after the operation of neurotomy, and the pastern let down accordingly. To prove that very many of these advanced cases of navicular disease are altogether improper subjects for the nerve operation, I have repeatedly, on the dissection of such cases (which have been destroyed by their owners rather than have them submitted to the operation), observed the tendon so attenuated by absorption opposite the caries of the bone that, upon holding it up between the light, I could distinctly see through its few remaining fibres.

This single pathological fact clearly shows the control which is reserved to the afflicted animal over his extensor muscles, in rendering them subservient to the flexors, and thereby averting the rupture of this disorganised part; and which is never known to happen, however extensively diseased.

Notwithstanding these unsuccessful cases, I have much to say in favour of the nerve operation, for the practical

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

May 26th.—Meeting of the Editorial Committee, N.V.M.A., 4.30 p.m., at 2 Verulam Buildings, Gray's Inn, W.C.1.

May 29th.—R.C.V.S. Voting Papers due to be returned.

June 5th.—**R.C.V.S. Annual General Meeting, Royal College of Surgeons, Dublin.** Followed by Annual General Meeting of the Victoria Veterinary Benevolent Fund. R.C.V.S. Annual Dinner.

June 5th.—Meeting of the Central Division, N.V.M.A., at 10 Red Lion Square, W.C.1.

June 6th.—Meeting of the South-Eastern Division, N.V.M.A., at the Royal Veterinary College, Camden Town.

June 13th.—D.V.S.M. Written Examinations.

June 13th.—R.A.V.C. Annual Dinner, Hotel Victoria.

June 16th.—D.V.S.M. Oral Examination commences.

July 2nd.—R.C.V.S. Quarterly Meetings.

July 3rd.—R.C.V.S. Quarterly Meetings.

July 4th.—R.C.V.S. Quarterly Meetings.

July 7th.—R.C.V.S. Membership Examination commences.

AUGUST 4th to 9th.—11th INTERNATIONAL VETERINARY CONGRESS, CENTRAL HALL, WESTMINSTER.

R.C.V.S. Council Election.

All members of the College will have received their Voting Papers for the election of Council, which were issued from Red Lion Square with the Annual Report on Thursday. Of the eight retiring members, Mr. Sumner and Sir John Moore are not seeking re-election. Three other vacancies are created, two by the deaths of Mr. Carter and Mr. McKinna, and the other by the resignation of Mr. W. S. King. For the 11 vacancies there are 15 candidates, including six retiring members who have been renominated.

The complete list is as follows:—

Abson, J., Sheffield; Brittlebank, J. W., Manchester; Burndred, W. G., Hanley; Coleman, J. C., Swindon; Cormack, J. L., Coventry; Hughes, R., Oswestry; Kirk, W. H., London; Livesey, G. H., London; Nairn, W., Blairgowrie; Rabagliati, D. S., Wakefield; Rees, W. D., Penygraig; Simpson, R., Carlisle; Spreull, A. (Senr.), Dundee; Walker, G. K., Abingdon, and Wragg, W. G., London.

This is an excellent choice of names, including representatives from new districts, and we are glad to see that there are two nominees from Scotland.

Members voting must be careful to see that that not more than ten names are left in the Voting Paper, and that the paper is signed before putting it in the post.

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utility of which we are unquestionably indebted to Mr. Sewell, of the Royal Veterinary College; but I feel no reluctance in postponing my remarks on that subject to a future opportunity, seeing that its merits and demerits are now under the investigation of an able an experienced member of our profession, Mr. Castley, Veterinary Surgeon to the 12th Lancers. *(To be concluded.)*

R.C.V.S. Obituary.

Carter, Joseph Henry, "Avalon," St. Mark's Road, Henley-on-Thames. Graduated, N. Edinburgh, July 13th, 1882; died May 15th, 1930, age 73 years.

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Piesse, Alexander Constant, of the R.S.P.C.A., 105 Jermyn Street, London, S.W.1. Graduated London, January 13th, 1885; died May 3rd, 1930, age 65 years.

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The Late Mr. J. H. Carter, F.R.V.C.S., F.R.S.E.

We deeply regret to report the death of Mr. J. H. Carter, F.R.C.V.S., F.R.S.E., for many years a successful practitioner in Burnley, and recently of Henley-on-Thames, to which place he retired a few years ago. Mr. Carter was struck down with paralysis in February last, and for many weeks has been lying unconscious under the unremitting and devoted care of his wife. He was seen to be ill when he attended the Council meetings at 10 Red Lion Square in January last, but none realised he was present for the last time. Mr. Carter passed away at his residence "Avalon," St. Mark's Road, Henley-on-Thames, on May 15th, 1930.

Mr. Carter had been a member of the Council of the R.C.V.S. since 1897. His popularity with that body is shown by the fact that he was made Vice-President no fewer than eight times. He was President in the year 1913-14, a year in which much important work was done. The Byelaws governing Preliminary Education, the professional curriculum, and the Fellowship examination, were revised and brought up to date and the regulations for the newly projected Diploma in Veterinary State Medicine were drawn up. The Petition for a new Charter to give the Council power to grant this Diploma, and for other matters, was drafted, and the Charter was duly granted in August, 1914, a month after his term of office expired. The very important Milk and Dairies Bills were under the consideration of the Parliamentary Committee of the Council in that year, and the President took deputations to the Local Government Board on the matter. It is proper to recall that when these Bills were passed into law, some at least of the Council's suggestions were incorporated.

Mr. Carter's local reputation in Burnley was of the highest order. He was a member of the Town Council and was Chairman of several Committees for many years. He had been a member of the National V.M.A. since 1894 and was President of the Lancashire V.M.A. on two occasions. As a Freemason he reached some of the highest offices, and it can be truly said of him that he gave of his best to the profession and to the public. We tender our sympathy to the widow and family in their great bereavement.

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Mr. William Woods, of Wigan, writes: "Mr. Carter's father was a widely-known and much respected veterinary surgeon in Bradford and all his three sons became veterinary surgeons; George, the eldest, died a year or two ago. "J. H." was well-liked and very quiet, and all who knew him had a great respect for him."

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In the course of an appreciative notice of the deceased gentleman, The *Burnley Express* states:—"The late Mr. Carter graduated at the New Veterinary College, Edinburgh, in 1882, obtained his Fellowship in 1887, and was elected an ordinary Fellow of the Royal Society, Edinburgh, in 1905. He came to Burnley in 1884, commencing practice in the town. He held inspectorships under the Board of Agriculture and Fisheries and the Lancashire County Council. He was on the examining board of the Royal College of Veterinary Surgeons at the time of his death. He was also a member of the National Veterinary Benevolent and Mutual Defence Society and of the Victoria Veterinary Benevolent Fund. Mr. Carter left Burnley some ten years ago, upon retiring from practice.

"During his residence in Burnley, Mr. Carter was in great demand at local and other agricultural shows. He

was examining veterinary surgeon at the Royal Show held in Liverpool in 1911, and at the Royal Show in Burnley in 1913. During the Boer War he visited Cape Town and Port Elizabeth, when he had veterinary charge of 950 horses on the S.S. "Hydaspes," and lost only six horses during the long voyage. Later he visited Musenberg and Wineberg, Russia. In his youth he served for three years in the 3rd West Yorkshire Rifle Volunteers, at the time when peace with honour was declared between this country and Russia, and he held the rank of captain in the National Reserve (Burnley contingent). Mr. Carter was also a prominent Freemason of 43 years standing, being the oldest member of Borough Lodge 1064. He was a past master of the Craft Lodge, and of the Mark Master Masons, Past Eminent Preceptor of the Knight Templars, and P.Z. in the Royal Arch. He was also a past Provincial Officer in all the aforesaid orders. He attended St. Peter's Church, Burnley.

"For many years he was a member of the Burnley Town Council, and for many years his return was unopposed. He was vice-chairman of the Highways and Sewage Committee for some years, and had also held the chairmanship. He was vice-chairman of the Small Holdings Committee at its inception.

"He is survived by his wife, the only daughter of the late Mr. J. S. Veevers, J.P., of Lower Reedley House, Reedley, two sons and three daughters."

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

The Colours and Markings of Horses.

To the Editor of the Veterinary Record.

Sir,—Absence from home has prevented me reading recent issues of the *Record*. I have just read that of March 1st, giving the report of the Committee that has been considering the question of recording colours and markings of horses.

As one of those who had originally drawn attention to this matter, I wish to congratulate the Committee on their excellent and timely report.

But we must certainly have reached "The Passing of the Horse," for I have read the remaining issues of March and there is not a single comment, approval or disapproval, from anybody. It is indeed sad that the members of the profession take so little interest in matters of vital importance.

It is of import that there should be a standard method of recording descriptions of horses, and it is the duty of the veterinary profession to make that standard and in such a fashion that it will be acceptable and intelligible to all those who may have to do with horses.

After all, the veterinary profession is only a very small portion of the horse-loving, horse-owning world, but its position entitles it to give the lead in such matters. To ensure that the system we adopt will be acceptable, we must, as far as possible, use only simple natural terms as against artificial ones. Students and others will not be helped by complications.

There are just a few suggestions and amendments I would like to put forward for consideration before the recommendations of the Committee are finally adopted.

In reference to colours, the colour of the muzzle should always decide. With colours other than black, the terms Dark and Light have always been in use and should still be used as the simplest and most uniform method of describing these variations, *i.e.* :—

Brown.	Dark Brown.	Light Brown.
Bay.	Dark Bay.	Light Bay.
Chestnut.	Dark Chestnut.	Light Chestnut.
Grey.	Dark Grey.	Light Grey.

In reference to Brown, if there is any distinct trace of Brown on the muzzle every owner will prefer to call it Brown, as Black is never a desirable colour, at least in high-class animals and the term Black-brown is misleading. "Dun" should read: *Dun, Blue Dun, Cream.*

Blue Dun when blue tinted—and here it is not always a black mane and tail as suggested by the Committee: you may have a grey mane and tail with a Blue Dun.

Cream has always a whitish mane and tail.

Roan.—Should be Brown Roan, Bay Roan, Chestnut Roan, Grey or Blue Roan. The term Red Roan is bad, it may be *Chestnut* or *Bay* and should be dropped.

Piebald is a combination patchwork of white and any other decided colour, *i.e.*—Black and White, Brown and White, Bay and White, Chestnut and White.

Skewbald.—A combination of undecided colours:—White and Grey or Blue, White and Roan, White and Dun.

In Piebald and Skewbald the colours should be noted.

With Odd-coloured or Spotted, the colours should be noted.

With reference to markings, they are best described by the anatomical situation on the limbs.

With the Head, the usual marks are:—Star, *Small Star* when small or slight. For the line running down the centre of face the term Streak is much more correct than Stripe. Stripe suggests its being put on with a brush. Streak is a natural term.

The Streak may be Broad or Narrow, but the term "Interrupted" is not at all necessary. If the Star and Streak are independent it reads Star and Streak. If Snip is independent, Star, Streak and Snip are correct. If they are continuous the term Streak covers all.

When the forehead is nearly or entirely white, and extending down the face, White Face is the best description. The term *Blaze* should be dropped, you may sometimes have a *Grey Face* or Grey nose.

If unilateral, just give near side or off side face.

Wall Eye should be recorded, but *showing white of eye* not necessarily.

Limb Markings.—Coronet, Heel (anterior aspect of Pastern and Bulbs), Pastern, Fetlock, Leg, when above fetlock to any part of shin. Simply add Knee or Hock when such is included in marking.

In reference to Greys, it would be a mistake and a pity to drop the grand old term Dappled, which is so descriptive and well-known in poetry and history; also the term Fleabitten: the Grey or White with tiny Brown or Blue Dots on face and neck or sometimes all over.

Grey Ticked is better than Flecked.

Now I must say that I am not at all in love with the stereotyped printed Certificated form. I much prefer one written by the veterinary surgeon and I certainly could not approve of one with diagrams.

I would suggest that an actual photograph or snapshot would look better and is easily obtainable. Diagrams might add a further puzzle.

I do hope the Committee will not think that I have written in the spirit of adverse criticism. I thoroughly understand the very big job they had to deal with, and I only offer these suggestions for consideration, as supplementary.

The terms I give are well-known, long in use, and simple to follow and I hope they may be considered before the report is finally adopted.

Yours faithfully,

P. J. Howard.

Ennis.
March 30th, 1930.

The Milk Fever Problem.

To the Editor of The Veterinary Record.

Sir,—I was interested to read the particulars of the cases of milk fever treated with success with calcium gluconate (Sandoz) by Mr. W. Collinson, in your issue dated May 3rd.

In the *Veterinary Journal* for this month, I have described five cases in which neither this preparation nor

udder inflation with oxygen had the slightest effect, and I am certain that there remains a great deal of work to be done in elucidating the problem of milk fever, as apparently there is a secondary factor, that comes into the cases sometimes encountered, which renders further udder inflation, or treatment with ca. gluconate or any other preparation, useless. Following on my short note in your correspondence columns a few weeks ago, regarding the bad results I had experienced with ca. gluconate, Dr. Russell Greig very kindly wrote me, offering to examine samples of blood taken from milk fever cases *before treatment,* and I hope that some of the results will prove interesting. It will interest those who contend that milk fever cannot occur until after calving, that I had a case of milk fever in a Guernsey cow last week, that is not due to calve for a month. The analysis of her blood for calcium estimation was 4·36 mgms. per cent. and Dr. Greig states that this was unquestionably milk fever. This cow became unconscious *after udder inflation,* and with great difficulty was saved. I cannot understand why one will get a number of cases in which no treatment is successful. I noticed this first about two to three years ago and, since then, I should think that roughly 10 per cent. per year do not respond to treatment. I do not include those cases which are found early in the morning by the dairyman (having started during the night) and which are often hard cases to treat. I know that I am not unique in this experience, but some of our members will not record or report this information. I am determined, if possible, with Dr. Greig's assistance, to try and find out what are these cases, and what is the factor that defeats treatment. It is remarkable why cases, seen whilst only staggery, not only go down and become unconscious after intense udder inflation with oxygen, but remain unconscious (now and again they become conscious for a few hours and eat, and then lapse into unconsciousess again) and ultimately die. The season of the year has apparently no effect. When first noticed, the period extended from the end of August until early November. This year, it has started at the very beginning of the year. I am taking blood samples from every case met with, whether mild or otherwise, and I think that if others of us will only do the same, we should get to the bottom of this problem.

Yours faithfully,

J. F. D. Tuit, M.R.C.V.S.

1 St. Cross Road,
Winchester.
May 7th, 1930.

R.V.C. Union Society Magazine.

To the Editor of the Veterinary Record.

Sir,—It may be of interest to your readers to learn that the Union Society of the Royal Veterinary College, London, is publishing an annual Magazine. The first edition is now on sale, price 1s. 6d. Copies may be obtained on application to the Editor, Royal Veterinary College, Camden Town, London, N.W.1.

Yours faithfully,

N. P. Male, *Assistant Editor.*

The R.C.V.S. Council Election.

To the Editor of The Veterinary Record.

Sir,—In conversation at a recent Association Meeting, many members appeared to be under the impression that the voting papers in the R.C.V.S. Council election were not kept secret; I believe this impression is entirely false, but it appears to me a matter of some importance.

Would not a published statement on this point from some responsible member of Council clear the air and also, maybe, induce a very welcome increase in the members who use the privilege of voting?

Yours faithfully,

J. R. Baxter.

Lechlade,
Glos.

[Members need be under no apprehension as to the secrecy of the ballot for election to Council, R.C.V.S. The votes are counted by an outside firm of chartered accountants, and no member of Council or other member of the profession has access to the voting papers.—Ed.]

. . . . .

To the Fellows and Members of the Royal College of Veterinary Surgeons.

Gentlemen,—Having been nominated as a candidate for a seat on the Council of the Royal College of Veterinary Surgeons, I beg again to offer myself for election.

As I have lived and worked abroad for many years, the well-being of those members living overseas makes a special appeal to me. At the same time, I am aware that the prosperity of the Profession depends on the interests of the general practitioner at home being jealously guarded.

I strongly advocate the claims of our Profession in regard to public health work, and consider that we should work loyally and in close co-operation with the Medical Profession, at the same time maintaining an independent position.

I would take this opportunity of expressing my thanks to those who gave me their votes on previous occasions, and if this time I am successful in my candidature, I shall do all in my power to further the interests of the Profession as a whole.

Yours faithfully,

D. S. Rabagliati.

County Hall,
Wakefield.
May 16th, 1930.

ADVERTISEMENTS RECEIVED TOO LATE FOR CLASSIFICATION.

WANTED during Summer months.—Qualified Assistant. Canine experience essential.—Full particulars, age, salary, etc. (live in), Aveston, V.S., Bath.

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WANTED, ASSISTANT.—Mixed Practice. South-West England. Please state age, height, experience and salary; live out.—Box 118.

WANTED.—PARTNERSHIP (or Assistantship) in good-class Practice (canine) with view to early succession—or would purchase. Age 33; keen; good surgeon.—Box 119.

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